4.0 IMPACTS OF THE ALTERNATIVES

The terms "effect" and "impact" are used synonymously under NEPA. Impacts includes ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Direct effects are caused by the action itself and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Cumulative impacts are those impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Sections 4.1 through 4.3 of this document discusses the direct and indirect impacts on the physical, biological, and socio-economic environment that are likely to occur under each of the proposed alternatives, including the status quo alternative. Section 4.4 presents the reasonably foreseeable cumulative effects of the environment from the proposed alternatives.

4.1 Physical Impacts

PHYSICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
PHYSICAL STRUCTURE	Changes to the physical environment as a result of VMS regulations
Alternative 1 Status quo	Direct impact No direct impacts beyond what has been considered in previous NEPA documents. Indirect impact Little data available to assess OA fishing location and intensity.
Alternative 2 Vessels using longline gear	Direct impact Data from approximately vessels 322 vessels that use longline gear to take and retain, possess or land OA groundfish (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from longline gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Longline gear primarily affects benthic environment when it slides on the bottom during setting and retrieval. Indirect impact VMS data from approximately 322 vessels using longline gear can be combined with data on fishing gear impacts and habitat to better understand how effort shifts affect the physical environment.
Alternative 3 Vessels using longline or pot gear	In **addition** to impacts identified for the 322 vessels under Alt. 2 Direct impact Data from approximately 193 vessels that use pot gear to take and retain, possess or land OA groundfish (145 directed groundfish, 21 Dungeness crab, 6 prawn, and 21 CA sheephead) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from pot gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Pots affect benthic habitat where individual pots contact seabed and when gear is dragged along the bottom during retrieval. Indirect impact VMS position data from approximately 193 vessels using pot gear can be combined with data on fishing gear impacts and habitat to better understand how pot vessel effort shifts affect the physical environment.
Alternative 4A Vessels using longline, pot or trawl gear, except: pink shrimp trawl	In **addition** to impacts identified the 515 vessels under Alt. 2 and 3 Direct impact Data from approximately 77 vessels using nongroundfish trawl gear, excluding pink shrimp trawl, (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from trawl gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Deterring illegal trawling in habitat protection areas is most important because trawl gear is believed to have a greater negative effect on benthic organisms and structure than other OA fishing gears. Includes approximately 59% of the OA nongroundfish trawl vessels that currently do not have VMS requirements. Indirect impact VMS position data from approximately 77 vessels using trawl gear can be combined with data on fishing gear impacts and habitat to better understand how trawl gear effort shifts affect the physical environment. Understanding where 59% of the nongroundfish bottom trawl vessel's effort is distributed is most important because trawl gear is believed to have greater impact on physical habitat than OA fixed gears.

PHYSICAL ENVIRONMENT - Continued	
PHYSICAL STRUCTURE	Changes to the physical environment as a result of VMS regulations
Alternative 4B Vessels using longline, pot or trawl gear	In **addition** to impacts identified for the 515 vessels under Alt. 2 and 3 Direct impact Data from approximately 131 vessels using nongroundfish trawl gear, including pink shrimp trawl (54 pink shrimp vessels. 23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels) could be used to maintain the integrity of habitat protection areas. Proposed habitat protection areas are most restrictive to bottom trawl gears. Unforeseen effects from nongroundfish trawl gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Deterring illegal trawling in habitat protection areas is most important because trawl gear is believed to have a greater negative effect on benthic organisms and structure than other gears used in the OA fisheries. All OA nongroundfish trawl vessels that do not currently have VMS requirements would be included. Indirect impact VMS position data from approximately 131 vessels (100% of the OA nongroundfish trawl vessels) using trawl gear can be combined with data on fishing gear impacts and habitat to better understand effort shifts and potential effects on the physical environment. Understanding where nongroundfish bottom trawl effort is distributed is important because trawl gear is believed to have a greater impact on physical habitat than other OA fishing gears.
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll	In **addition** to impacts identified for the 592 vessels under Alt. 2, 3 and 4A Direct impact Data from approximately 658 vessels using line gear (590 groundfish directed, 58 CA halibut, and 10 HMS vessels) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from line gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Of the OA gears, line gear is believed to have the least contact with the seabed and bottom dwelling organisms, and therefore the lowest risk to benthic habitat if incursions into habitat protection areas occur. Indirect impact VMS position data from approximately 658 vessels using line gear can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment.
Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline and line, and Dungeness crab pot gear	Direct impact Data from approximately 1,453 vessels: 322 vessels using longline gear (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut); 172 vessels using pot gear (145 directed groundfish, 6 prawn, and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), and 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from longline, pot, line, and nongroundfish trawl gear (excluding pink shrimp trawl) on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Proposed habitat protection areas are most restrictive to bottom trawl gear. Without pink shrimp, approximately 59% of the nongroundfish OA trawl fleet would have VMS. Indirect impact VMS position data from 1,453 longline, pot, nongroundfish trawl, and line gear vessels can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment.

PHYSICAL ENVIRONMENT - Continued	
PHYSICAL STRUCTURE	Changes to the physical environment as a result of VMS regulations
Alternative 6A Vessels with RCA restrictions; except pink shrimp trawl	Direct impact Data from approximately 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear (145 directed groundfish, 6 prawn, 21 Dungeness crab and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels); and 72 vessels using net gear (25 HMS and 47 CA halibut) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from longline, pot, line, and nongroundfish trawl gear (excluding pink shrimp trawl) on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Proposed habitat protection areas are most restrictive to bottom trawl gear. Without pink shrimp, approximately 59% of the nongroundfish OA trawl fleet would have VMS. Indirect impact VMS position data from approximately 1,583 longline, pot, nongroundfish trawl, and line gear vessels can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment.
Alternative 6B Vessels with RCA restrictions: except salmon troll north that retain only yellowtail rockfish and pink shrimp trawl	Direct impact Essentially the same as Alt. 6A except that data that could be used to maintain the integrity of areas closed to protect habitat from fishing gear impacts is not available for 176 salmon troll vessels that retain only yellowtail rockfish north of 40°10' N. lat. Total of 1,525 vessels. Indirect impact Essentially the same as Alt. 6A except that position data from 176 salmon troll vessels that retain only yellowtail rockfish north of 40°10' N. lat. would not be available.
Alternative 7 Vessel >12 ft with RCA restriction; except, pink shrimp trawl	Direct impact Essentially the same as 6A except that data from approximately 22 vessels (6 longline, 2 pot, and 14 line gear vessels) would not be available. Total of 1,561 vessels. Indirect impact Essentially the same as 6A except that data from approximately 22 vessels would not be available. However, it is likely that none of these small vessels fish seaward of 3 miles.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal	Direct impact Data from 1,463 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels using directed groundfish pot gear; 40 vessels using CA halibut trawl gear, and; 882 vessels using line gear (590 groundfish directed, 58 CA halibut, and 234 salmon troll vessels) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from longline, pot, line, and CA halibut nongroundfish trawl gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Proposed habitat protection areas are most restrictive to bottom trawl gear. Approximately 31% of the OA nongroundfish trawl fleet would have VMS. Indirect impact VMS position data from approximately 1,463 vessels can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment. This alt. provides trawl data for only 31% of the OA non groundfish trawl fleet. Understanding where nongroundfish bottom trawl effort is distributed is important because trawl gear is believed to have a greater impact on physical habitat than other OA fishing gears.

PHYSICAL ENVIRONMENT - Continued	
PHYSICAL STRUCTURE	Changes to the physical environment as a result of VMS regulations
Alternative 9 Directed OA vessels - those that land more than 500 lb of groundfish in a calendar year.	Direct impact Data from 1,123 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 vessels using CA halibut and 3 vessels using pink shrimp trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear (590 groundfish directed, 1 HMS and 6 salmon troll vessels) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from longline, pot, line, and nongroundfish trawl gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Proposed habitat protection areas are most restrictive to bottom trawl gear. Approximately 7% of the OA nongroundfish trawl fleet would have VMS. Indirect impact Provides VMS position data from approximately 1,123 longline, pot, nongroundfish trawl, and line gear vessels that can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment. This alternative provides trawl data for only 7% of the OA non groundfish trawl fleet. Understanding where nongroundfish bottom trawl effort is distributed is important because trawl gear is believed to have a greater impact on physical habitat than other OA fishing gears.
Alternative 10 No Action, No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impact No direct impacts beyond what has been considered in previous NEPA documents for status quo. Indirect impact Little data available to assess OA fishing location and intensity.
Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.	

4.1.1 Physical structure

The proposed action pertains to a VMS monitoring program that provides vessel position information for monitoring fishing locations in relation to time/area closures. The fleet coverage level, that portion of the overall OA fishing fleet that would be required to have VMS and provide declaration reports, is the primary difference between the proposed alternatives. Each of the alternatives defines the portion of the OA fleet, that would be required to carry and use VMS transceivers and provide gear declaration reports. Alternative 10 is the only alternative that goes beyond VMS coverage by discontinuing the non-trawl and trawl RCA requirements for the OA fisheries.

Direct effects on the physical environment result from changes to the structure of the benthic environment as a result of fishing practices. Direct effects on the physical environment from VMS could occur if, as a result of the position information being collected, changes to the physical environment from OA groundfish fishing either increased of decreased. VMS data could be used to maintain the integrity of habitat protection areas designed to protect the physical environment from fishing gear impacts and would therefore provide a positive benefit.

In June 2005, the Council reviewed the Pacific Coast Groundfish, Essential Fish Habitat Designation and Minimization of Adverse Impacts, Draft EIS (EFH EIS). In response to the EFH EIS, the Council recommended that NMFS implement specific habitat protection measures under Amendment 19 to the FMP. Measures to protect benthic habitat included: 1) Prohibit dredge, beam trawl, and bottom trawl gear with footrope diameter greater than 19" throughout the EEZ; 2) prohibit bottom trawl fishing within the EEZ seaward of 700 fathoms; 3) prohibit bottom trawl with footrope greater than 8" shoreward of 100 fathoms; 4) close specified areas to bottom trawl (Scottish seine gear would be exempt); 5) close specified areas to any type of bottom contact gear, and; 6) Close specified areas to all fishing. The Council's recommended action affects groundfish LE bottom trawl vessels that are already required to have VMS, as well as vessels using nongroundfish trawl gear that participate in the OA groundfish fishery and vessels using other OA gears that currently do not have VMS requirements.

The fishing gears used in the OA groundfish fishery each have different direct effects on the seabed or benthic environment. The amount of direct contact with the seabed, bottom structures, and benthic organisms varies widely between the different gears, as does the intensity of the contact. A brief summary of type of contact each OA gear makes with the seabed is presented in this EA. However, chapter 3, The Affected Environment, of the EFH EIS contains a full discussion of the fishing gears used by OA fishers, the effects of each gear on the seabed, and the organisms that are affected. The EFH EIS also describes the physical impacts on the environment under status quo management.

The words "pot" and "trap" are used interchangeably to mean baited boxes set on the ocean floor to catch various fish and shellfish. They can be circular, rectangular or conical in shape. The pots may be set out individually or fished in stings with weights or anchors at each end. The effect of a pot gear on the seabed is related to the weight and structure of the pot as well as to how far and fast the pot moves along the seabed while it is being retrieved. The gear, groundline, and weights or anchors can effect bottom organisms and structure if they are drug along the bottom before ascent (Rose et al.2002).

Longline fishery involves the setting out of a horizontal line to which other lines (gangions) with baited hooks are attached. This horizontal line is secured between anchored lines and identified by floating surface buoys, bamboo poles and flags. The longline may be laid along or just above the ocean floor (a bottom longline) or may be fished in the water column (floating or pelagic longline). The anchors or weights, the hooks and the mainline on longline gear can produce effects on the seabed as they travel over the seabed during setting or retrieval. The key determinant of the effects of longlines on the seabed is how far the gear travels during setting and retreval. Significant travel distance is more likely during retrieval. If the hauling vessel is not directly above the part of the line that is being lifted, the line, hooks and anchors can be pulled across the seabed before ascending. If the hooks and lines snare exposed organisms they can be injured or detached. Lines may undercut emergent structures or roll over them.

The relatively low breaking strength of the line may limit damage of more durable seafloor features (Rose et al. 2002). The mainline can also be moved numerous feet along the bottom and up into the water column by fish, resulting in disturbance to bottom organisms that are in the path of the groundline (Johnson 2002).

Trawling involves the towing of a funnel shaped net or nets behind a fishing vessel. Trawl gear may be fished on the bottom, near the bottom, or up in the water column to catch a large variety of species. The mouth of a trawl net is spread horizontally in the water column by using two doors located one on each side of the net, forward and outward of the net. The doors, generally made of metal, are pushed apart and down by hydrodynamic forces and by their own weight, and some increase their spread by bottom friction. The footrope or ground rope is directly attached to the lower leading edge of the mouth of the net. The head rope is the top of the mouth of the net (also called floatline). The footrope may be weighted with chain or may be rope-wrapped cable when used on a soft bottom. If the net is to be towed over rough bottoms (as for spot prawns) or over soft sea beds that may contain boulders, rubber disks or rubber rollers (also called bobbins) are attached to the footrope under the center and wing sections of the net, to allow the net to ride over obstacles.

Variations in the composition and design of the components of a trawl net changes the influence and effects on benthic ecosystems. Of the major components, trawl doors, affect the smallest area of seabed, though trawl door marks are the most recognizable and the most frequently observed effect of trawls on the seabed. The doors travel across the seabed oriented at an angle to the direction of travel. The resulting track marks consist of the area of direct contact as well as a berm of sediment displaced toward the trawl centerline. The bridles are cables that connect the trawl doors to the trawl net. The bridles may also be in contact with the seabed for a part of the towing distance. Footrope effects are related in part to the contact force and the area over which this force is distributed. The netting may also retain objects and organisms that are undercut or suspended off the seabed by the passage of the footrope.

The pink shrimp trawl fishery commonly uses a four seam net in a box trawl that does not have a hood. It is a high-rise trawl. Unlike other cod-ends, the cod-end of shrimp net is generally not constructed with riblines that run the length of the cod-end. A single rigged shrimp vessel may use the same doors that are used by groundfish trawl vessels, while a double rigged shrimp vessel uses doors that are typically much larger than those used by groundfish trawlers. Shrimpers seek stable doors that can get down to the bottom fast. They are generally made of wood with a wide flat steel shoe (heavy plate) on the bottom. The doors are rigged with short bridles to the net. The footropes used in pink shrimp trawling are not protected with any rollers or bobbins or other gear and are generally rigged to run about 12-18 inches off the bottom (31-46cm). That is, the footrope of shrimp nets is not designed to contact the bottom. Tickler chains or ladder chains, are sometimes used in the shrimp trawl to drag along the muddy bottom to stir up the shrimp so they rise and enter the net. Unless chain is used or supplementary weights are added, the bridles skim the surface of the seabed. Small-scale vertical features on soft substrates can be flattened by this action. Emergent structures and organisms can be vulnerable to penetration or undercutting by bridles.

In the OA fishery, there is a variety of commercial line gears that use hooks and lines in various configurations. These include vertical hook and line, jigs, handline, rod and reel, vertical and horizontal setline, troll, cable gear and stick gear. Vertical hook-and-line gear involves a single line anchored at the bottom and buoyed at the surface so as to fish vertically. Baited circle hooks are spaced about 12 inches apart (30.5 cm) and are tied, with monofilament leader, to the mainline. The vertical hook and line anchor has contact with the seabed. Handline and jig fisheries use vertical, weighted monofilament lines on which baited hooks are attached at intervals using wire spreaders or individual leaders are attached with swivels. The jig (weight) is periodically dropped to the seabed to determine depth. Albacore (an HMS species) jigs are fished on the surface of the water. Fishing poles rigged with monofilament line of various strengths and hooks of various sizes and designs are used. When fishing near the bottom or near reefs, the sinkers may come in contact with the substrate. Stick gear uses a plastic (PVC) or aluminum pipe which is suspended from a mainline and weighted with about a three pound weight (1.5 kg). Wire spreaders are

attached at a selected distance up and down the pipe. Leaders are attached with a swivel clip to these wire spreaders. The weight contacts the seabed and can bounce along the bottom.

Troll gear is used to harvest salmon and groundfish. Trolling involves towing multiple lines with multiple hooks behind a vessel moving at speeds suited to the fish desired. Salmon troll uses steel lines (main lines), attached to the poles by a tag line, which are weighted with 20-65 pound (9-29 kg) lead weights called cannonballs. Up to four main lines are used on each outrigger, though two or three mainlines are most common. Each line may have four to ten spreads per line depending on the species of salmon targeted. Salmon are fished pelagically as well as close to the bottom. Most salmon troll gear never comes in contact with the seabed. In order to avoid loss of line and outriggers if hang-ups occur, the cannonball weights may be attached to the lines by leather straps or other lighter line which is designed to break should the weight hang up on the seabed or gear. One type of troll gear used for groundfish is often called 'dingle bar'gear, so named because when the five to seven foot iron bar (1.5-1.75" in diameter) touches bottom there is a distinct 'ding' transmitted up the steel trolling wire. The gear is designed to be fished three to six feet above rocky bottom and the iron weight is allowed to touch the bottom only occasionally. This gear is used primarily to target lingcod and is very selective. The iron and steel "dingle" bars can contact the seafloor. The hooks and line can snag on break hard corals, while leaving soft corals unaffected. During retrieval, invertebrates and other lightweight organisms can also be dislodged as well as rocks, corals, kelps and other objects.

Gillnets are flat, rectangular nets that hang vertically in the water from a buoyed cork line that is weighted with a lead line. The nets are made of a lightweight multifilament nylon or monofilament strands with mesh sized to select the specific catch. Gillnets can either be fished as a set or anchor net (setnet). The cork and lead lines and the nylon nets are much lighter than those used in seine netting, while the anchors used on set gillnets are often heavier or larger than those used with longlines (Rose et al. 2002). The benthic effects of a set gillnet fishing operation occurs during the retrieval of the gear. During retrieval the nets and leadlines are more likely to snag bottom structures or the exposed sedentary benthos. The anchoring system can also affect bottom organisms and structure if they are dragged along the bottom before ascent. A trammel net is a gillnet made with two or more walls joined to a common float line.

One of the major benefits of VMS is its deterrent effect. VMS is expected to have a beneficial deterrent effect (the reduction in illegal fishing in closed areas when fishing vessel operators know that they are being monitored) by reducing the likelihood of unforeseen effects on the physical environment resulting from unknown illegal fishing in area that are closed to protect habitat from fishing gear effects. It has been demonstrated that if fishing vessel operators know that they are being monitored and that a credible enforcement action will result from illegal activity, then the likelihood of that illegal activity occurring is significantly diminished. In this context, VMS is a preventive measure that may reduce potential violations.

Indirect impacts from fishery management actions include changes in fishing practices that affect the physical environment, but are further away in time or location than those occurring as a direct impact. Area management involves closing and sometimes opening areas formerly closed to specific OA fishing gear groups. When the size or location of closed areas change, the fishing fleet makes shifts in fishing effort. Understanding the nature of effort shifts, especially understanding where the effort shifts to (and the habitat types most common in these areas) and where the effort shifts from (and the habitat types most common in these areas), is critical to understanding how management actions will likely increase or decrease beneficial and adverse impacts to habitat.

VMS is expected to provide data that can be used in combination with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment. Therefore, VMS provides an indirect benefit to the physical environment. The amount of information available for assessing the impacts of fishing effort on the physical environment varies under each of the alternatives. The indirect effects vary between the alternatives and depends on the proportion of the fleet that is required to carry VMS and provide declaration reports, as well as the potential impacts associated with a particular gear type.

Comparison of the Alternatives

Alternative 1, Status Quo, would continue the requirement for declaration reports from OA vessels using nongroundfish trawl gear in the RCAs. Under Alternative 1, OA fishery position data would only be available from vessels who voluntarily use VMS units and from vessels that fish pursuant to the OA regulations, but carry VMS because the vessel is registered to a LE permit. Section 3.3 of the EIS, for the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish Fishery, addressed the physical impacts on the environment under status quo management. In addition, EFH EIS describes the physical impacts on the environment under status quo management.

Alternative 2 maintains the declaration provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 322 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut) using longline gear to take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 would require the smallest proportion of the OA fleet (only vessels using longline gear) to have and use VMS and therefore provide the least amount of data for monitoring vessel compliance with habitat protection areas or for assessing fishing effort and intensity relative habitat areas of concern. Longline gear primarily affects the benthic environment when it is slides on the bottom during setting and retrieval. Given the mobility of vessels within the fishery, directed longline vessels could choose to change gears to avoid the VMS requirements.

Approximately 515 vessels would be required to have VMS under Alternative 3. Alternative 3, includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead) using pot gear to take and retain, possess or land groundfish. The addition of the pot gears to the VMS program under Alternative 3 will aid in maintaining the integrity of closed areas that are designed to protect the benthic environment from the longline and pot gear impacts. Pots affect benthic habitat where individual pots contact seabed and when gear is dragged along the bottom during retrieval. Similar to Alternative 2, under Alternative 3, some vessels may choose to fish with line gear to avoid the VMS requirements. Alternative 3 would provide more data than Alternative 2, however it would provide less data than Alternative 4A which would require VMS to be carried by 592 vessels.

Alternatives 4A and 4B add VMS coverage for nongroundfish trawl vessels to the pot and longline vessels identified under Alternative 3. The primary difference between Alternatives 4A and 4B is that Alternative 4A adds the VMS and declaration reporting requirement for approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels) using nongroundfish trawl gear. While Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4A plus 54 pink shrimp vessels. Many vessels that fish for pink shrimp are also registered to LE groundfish permits and therefore already have VMS requirements. Alternative 4B adds those pink shrimp vessels that are not also registered to LE groundfish permits. Approximately 646 vessels would be required to have and use VMS under Alternative 4B.

When reviewing the EFH EIS the Council made recommendations to NMFS that recognized the need to adopt measures to protect benthic habitat from fishing gear impacts, particularly from bottom trawl gear impacts that occur from both groundfish and nongroundfish bottom trawl gear. The need to monitor all bottom trawl vessels for compliance with VMS was also recognized by the Council. Alternative 4A and 4B would aid in maintaining the integrity of habitat protection areas in relation to longline, pot and trawl gear incursions. Deterring illegal trawling in habitat protection areas is most important because trawl gear is believed to have a greater negative effect on benthic organisms and structure than other OA fishing gears. Alternative 4A Includes approximately 59% of the OA nongroundfish trawl vessels that currently do not have VMS requirements while Alternative 4B includes all of the nongroundfish trawl vessels. The benefits of maintaining the integrity of the habitat protections areas where bottom trawling is prohibited is greatest under Alternative 4B.

Alternative 5A includes vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon

troll. Therefore, Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 590 groundfish, 58 California halibut, and 10 HMS vessels using line gear. The total number of vessels required to have and use VMS under Alternative 5A is 1,250. Alternative 5B is based on the Enforcement Consultant's recommendations to the Council. This alternative is the same as 5A except that it excludes vessels in fisheries where incidental catch of overfished species was considered to be very low, but it does include salmon troll vessels. Alternative 5B includes approximately 1,453 vessels. Of the OA fishing gears, the line gears are projected to have the least contact with the benthic habitat and will therefore have fewer habitat area closures than bottom or pink shrimp trawl. Because Alternative 5A and 5B exclude the pink shrimp trawl vessels, the ability to maintain the integrity of habitat areas closed to bottom trawling is reduced over Alternative 4B.

Alternative 6A, applies to any vessel engaged in commercial fishing to which an RCA restriction applies. Data from approximately 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear (145 directed groundfish, 6 prawn, 21 Dungeness crab and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) and 72 vessels using net gear (25 HMS and 47 CA halibut) could be used to maintain the integrity of habitat protection areas. Alternative 6A affects the largest number of OA vessels and would therefore provide the largest amount of position data for monitoring incursions into habitat protection areas or for assessing fishing effort and intensity relative to habitat areas of concern. Because Alternative 6A excludes the pink shrimp trawl vessels, it only includes about 59% of the OA nongroundfish trawl vessels. Therefore, the ability to maintain the integrity of habitat areas closed to bottom trawling is reduced over Alternative 4B. The impacts on the physical environment resulting from Alternative 6B are essentially the same as Alternative 6A except that data that could be used to maintain the integrity of areas closed to protect habitat from fishing gear impacts would not be available for salmon troll vessels that retain only yellowtail rockfish north of 40°10' N. lat. Alternative 6B includes 176 salmon troll vessels as compared to 234 under Alternative 6A. Because salmon troll gear is believed to have minimal contact with the seabed, Alternative 6B provides only a slightly greater ability to maintain the integrity of habitat protection areas from salmon troll impacts. Impacts on the physical environment resulting from Alternative 7 are essentially the same as 6A except that data from approximately 22 vessels (6 longline, 2 pot, and 14 line gear vessels) would not be available. It is likely that none of these small vessels are fishing outside of 3 miles.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, and California sheephead pot. Approximately 1,463 vessels are included under Alternative 8: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). Data from the sea cucumber, ridgeback prawn, and pink shrimp trawl vessels would not be included under Alternative 8. Proposed habitat protection areas are most restrictive to bottom trawl gear. Therefore, the ability to maintain the integrity of habitat protection areas from trawl fishing gear impacts associated with these vessels and to gather data that may be used to better understand effort shifts and the potential effects on the physical environment is reduced over Alternatives 4A-7. Under Alternative 8, approximately 31% of the OA nongroundfish trawl fleet would have VMS.

Because Alternative 9 excludes those vessels with minimal annual catch of groundfish, those that land less than 500 lb of groundfish in a calendar year, it includes fewer nongroundfish trawl vessels than Alternative 8. Under Alternative 9, data from 1,123 vessels could be used to maintain the integrity of habitat protection areas from longline, pot, trawl, line, net and other fishing gear impacts. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab, 2 prawn and 2 sheephead); 9 California halibut 3 pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll

vessels). Unforeseen effects from longline, pot, line, and nongroundfish trawl gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. However, only about 7% of the OA nongroundfish trawl fleet would have VMS under Alternative 9. Proposed habitat protection areas are most restrictive to bottom trawl gear. Therefore, the ability to maintain the integrity of habitat protection areas from trawl fishing gear impacts associated with these vessels and to gather data that may be used to better understand effort shifts and the potential effects on the physical environment is reduced over Alternatives 4A-7.

The projected impacts on habitat resulting from Alternative 10, are essentially the same as those identified under Alternative 1 except that secondary benefits to the physical habitat resulting from the existence of nontrawl and nongroundfish trawl RCAs for the OA fisheries may no longer exist. Although RCAs were not developed for habitat protection, but rather to reduce fishing effort in areas where overfished species were most abundant, there may have a secondary benefit, particularly in respect to the non-groundfish trawl RCAs.

4.2 Biological Impacts

BIOLOGICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
TOTAL CATCH	Changes in groundfish mortality levels as a result of VMS regulations
Alternative 1 Status quo	Direct impacts A higher level of fishing mortality than those being used to estimate total catch, may affect the integrity of closed areas if incursions result in higher rates of overfished species catch than is projected. Indirect impacts Little specific information on OA fishing location data is available for understanding impacts of effort shifts on adult and juvenile groundfish populations, or for refining overfished species total catch estimates. Declaration reports may be used to estimate the number of vessels/trips in conservation areas by nongroundfish trawl vessels.
Alternative 2 Vessels using longline gear	Direct impacts Data from approximately 322 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut) using longline gear to take and retain, possess or land OA groundfish can be used to maintain the integrity of RCAs. The risk of the actual catch exceeding the OYs for overfished species due to illegal fishing in the RCAs is reduced for directed groundfish and Pacific halibut longline vessels that take and retain, possess or land groundfish. Maintaining the integrity of the RCAs will reduce the risk of exceeding the yelloweye rockfish OY as a result of Pacific halibut vessel incursions into the RCAs. No change over Alt.1 for HMS longline vessels because pelagic longline is currently prohibited gear in the EEZ. Indirect impacts Fishing effort and location data from 322 longline vessels could improve the understanding of groundfish mortality. Data can be combined with observer, survey, and fish ticket data to better estimate: 1) total fishing mortality, 2) impacts on juveniles and other fishery resources related to changes in fishing locations and intensity, 3) fishing intensity (amount of time vessels are in an area), and 4) changes in fishing location and intensity over time.
Alternative 3 Vessels using longline or pot gear	In **addition** to the impacts from the 322 vessels identified under Alt. 2: Direct impacts Data from approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead) using pot gear to take and retain, possess or land OA groundfish can be used to maintain the integrity of RCAs. The risk of actual catch exceeding the OYs for overfished species is reduced for directed groundfish pot and prawn vessels. However, the risks of exceeding the OYs due to incursions by Dungeness crab, CA sheephead, and prawn pot vessels is relatively low Indirect impacts Fishing effort and location data from approximately 193 vessels could improve the understanding of groundfish mortality for pot vessels in the same ways as identified under Alt. 2 for longline vessels.
Alternative 4A Vessels using longline, pot or trawl gear, except: pink shrimp trawl	In **addition** to impacts from the 515 vessels identified under Alt. 2 & Alt. 3: Direct impacts Data from approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear can be used to maintain the integrity of RCAs. The risk of actual catch exceeding the OYs for overfished species is reduced for nongroundfish trawl vessels. Maintaining the integrity of the RCAs will reduce the risk of exceeding the bocaccio or canary rockfish OYs as a result of CA halibut vessel incursions into the RCAs. Indirect impacts Fishing effort and location data from approximately 77 vessels could improve the understanding of groundfish mortality for trawl vessels in the same ways as identified under Alt. 2 for longline vessels.

BIOLOGICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
TOTAL CATCH	Changes in groundfish mortality levels as a result of VMS regulations
Alternative 4B Vessels using longline, pot or trawl gear	In **addition** to impacts from the 515 vessels identified under Alt. 2 & Alt. 3: Direct impacts Data from approximately 131 vessels (54 pink shrimp, 23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear can be used to maintain the integrity of RCAs. The risk of actual catch exceeding the OYs for overfished species is reduced for nongroundfish trawl vessels. Maintaining the integrity of the RCAs will reduce the risk of exceeding the bocaccio or canary rockfish OYs as a result of CA halibut vessel incursions into the RCAs. No change over Alt.4A, because pink shrimp vessels are not prohibited from fishing in the RCAs. Indirect impacts Fishing effort and location data from approximately 131 vessels could improve the understanding of groundfish mortality for trawl vessels in the same ways as identified under Alt. 2 for longline vessels.
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll	In **addition** to impacts from the 592 vessels identified under Alt. 2, 3, and 4A: Direct impacts Data from approximately 658 vessels (590 groundfish directed, 58 CA halibut, and 10 HMS) using line gear that take and retain, possess or land OA groundfish can be used to maintain the integrity of RCAs. The risk of actual catch exceeding overfished species OYs is reduced for directed groundfish vessels. Maintaining the integrity of the RCAs will reduce the risk of exceeding the bocaccio or canary rockfish OYs as a result of CA halibut vessel incursions into the RCAs. No change over Alt. 1 for HMS line vessels because they are not projected to catch overfished species. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish as the result of salmon troll vessels altering their gear to catch groundfish in the RCAs are greater than Alt. 5B. Indirect impacts Fishing effort and location data from approximately 658 line gear vessels that could improve the understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels.
Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline and line, and Dungeness crab pot gear	Direct impacts Data from 1,453 vessels: 322 vessels using longline gear (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut); 172 vessels using pot gear (145 directed groundfish, 6 prawn, and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), and 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) can be used to maintain the integrity of RCAs. No change over Alt.1 for HMS. Overfished fished species catch projections for the salmon troll fishery represent incidental fishing mortality. In 2005, salmon troll vessels are projected to encounter 1.6 mt or 33% of the canary rockfish taken in all OA fisheries, or 3.42% of the OY. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish are reduced. VMS deters mixed fishing strategies where vessels alter gear to catch groundfish within the RCAs. The risks of exceeding the OYs due to incursions by Dungeness crab is relatively low Indirect impacts Fishing effort and location data from the 1,453 vessel identified above could improve the understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels

BIOLOGICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
TOTAL CATCH	Changes in groundfish mortality levels as a result of VMS regulations
Alternative 6A Vessels with RCA restrictions; except pink shrimp trawl	Direct impacts Data from approximately 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear (145 directed groundfish, 6 prawn, 21 Dungeness crab and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) and 72 vessels using net gear (25 HMS and 47 CA halibut) could be used to maintain the integrity of RCAs. The risk of the actual catch exceeding the OYs for overfished species due to illegal fishing in the RCAs is reduced for directed groundfish fisheries. Maintaining the integrity of the RCAs will reduce the risk of exceeding the yelloweye rockfish OY as a result of Pacific halibut vessel incursions into the RCAs. Overfished species catch projections for the salmon troll fishery represent incidental fishing mortality. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish are reduced. VMS deters mixed fishing strategies where vessels alter gear to catch groundfish within the RCAs. In 2005, salmon troll vessels are projected to encounter 1.6 mt or 33% of the canary rockfish taken in all OA fisheries, or 3.42% of the OY. No change over Alt. 1 for HMS line and sea cucumber vessels because they are not projected to catch overfished species Indirect impacts Fishing effort and location data from the 1,583 vessels identified above could improve the understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels.
Alternative 6B Vessels with RCA restrictions: except salmon troll north that retain only yellowtail rockfish and pink shrimp trawl	Direct impacts The ability to maintain the integrity of the RCAs is slightly less than Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. 1,525 vessels are included under this alternative. Indirect impacts Increased data on fishing effort is slightly less than those identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded.
Alternative 7 Vessel >12 ft with RCA restriction; except, pink shrimp trawl	Direct impacts The ability to maintain the integrity of the RCA is slightly less than Alt. 6A because approximately 22 vessels (those <12 feet in length) less than that identified under Alt. 6A are excluded. 1,561 vessels are included under this alternative. Few if any of these vessels are likely to fish in Federal waters. Indirect impacts Increased data on fishing effort is slightly less than that identified under Alt. 6A; approximately 22 vessels (those <12 feet in length) less than those identified under Alt. 6A are excluded. Few if any of these vessels are likely to fish in Federal waters.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal.	Direct impact Data from vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels using directed groundfish pot gear; 40 vessels using CA halibut trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear (590 groundfish directed, 58 CA halibut, and 234 salmon troll vessels) could be used to maintain the integrity of RCAs. The risk of actual catch exceeding the OYs for overfished species as the result of incursions into the RCAs is reduced for directed groundfish, and for those incidental fisheries that have the greatest potential for catching ovefished species. The risk of actual catch exceeding the OYs for overfished species is higher for nongroundfish trawl vessels than it is under Alt. 4A-7. Indirect impact Provides VMS position data from approximately 1,463 vessels, identified in the preceding paragraph, that can be combined with observer, survey, and fish ticket data to improve the understanding of groundfish mortality for pot vessels in the same ways as identified under Alt. 2 for longline vessels.

BIOLOGICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
TOTAL CATCH	Changes in groundfish mortality levels as a result of VMS regulations
Alternative 9 Directed vessels. those that land more than 500 lb of groundfish in a calendar year.	Direct impact Data from 1,123 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab, 2 prawn and 2 sheephead); 9 vessels using CA halibut and 3 vessels using pink shrimp trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear (590 groundfish directed, 1 HMS and 6 salmon troll vessels) could be used to maintain the integrity of the RCAs. The risk of the actual catch exceeding the OYs for overfished species due to illegal fishing in the RCAs by directed groundfish vessels is reduced. Maintaining the integrity of the RCAs will reduce the risk of exceeding the yelloweye rockfish OY as a result of Pacific halibut vessel incursions into the RCAs. Overfished species catch projections for the salmon troll fishery represent incidental fishing mortality. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish is greater than Alt. 5A-8 if vessels alter gear to catch groundfish within the RCAs. The risk of exceeding the bocaccio or canary rockfish OYs as a result of CA halibut vessel incursions into the RCAs is greater than Alt 4A-8. Indirect impact Provides VMS position data from approximately 1,123 vessels, identified in the preceding paragraph, that can be combined with observer, survey, and fish ticket data to improve the understanding of groundfish mortality for pot vessels in the same ways as identified under Alt. 2 for longline vessels.
Alternative 10 No Action. No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impact Overfished species catch is expected to increase for the directed fisheries, the non-groundfish trawl fisheries except pink shrimp, and the Pacific halibut fishery unless additional management measures, such as extended closed seasons, are used to restrict the fishery. Indirect impact Little data available to assess OA fishing location and intensity.
Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.	

4.2.1 Fishing mortality

Direct impacts on fishing mortality include changes in the mortality of target and non-target species (incidental catch). This action would expand the VMS program to the OA gear sectors to monitor fishing location in relation to time-area closures. Direct benefits result if the integrity of RCAs are maintained as a result of VMS requirements.

To monitor the attainment of OYs, the total catch level must be estimated for each species or species group. The fishing mortality level (total catch level) for each species is the sum of retained catch and discarded catch (incidental or targeted catch that is not retained and landed by the vessel). There is no exact measure of discard amounts in the OA fisheries. For all species except lingcod, sablefish, and nearshore rockfish species, it is assumed that discarded fish are dead or die soon after being returned to the sea. Total catch estimates of overfished species in the LE fisheries are currently based on a bycatch accounting model (for further information on current bycatch model see the preamble discussion in the proposed rules for the Harvest Specifications and Management Measures from 2003, 2004 and 2005-2006; January 7, 2003, 68 FR 936 or Section 3.3 of the EIS, for the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish Fishery, addressed the physical impacts on the environment under status quo management.) which has applied depth-related discard assumptions since 2003. At this time, total catch estimates of overfished species taken in the OA fishery are based on landed catch from fish tickets, assumed discard rates, discard and discard mortality assumptions, expertise from state fisheries managers, and industry advisory body input. However, as observer and other data become available more formal bycatch modeling is expected to be used for a portion (directed) or perhaps all of the OA fisheries. The current bycatch model for the LE fisheries uses overfished species bycatch rates that are representative of fishing outside the RCAs, and would be higher if areas within the RCAs were included. An OA fishery bycatch model would likely be similar for the directed OA fisheries.

Discard assumptions used for modeling the fishery to estimate total catch of overfished species have been based on bycatch rates for areas where fishing is expected to occur. If the RCAs were not adequately maintained, landed catch would have higher bycatch rate associated with it than that assumed by the model. This is especially a concern for those overfished species that constrain the fisheries and for which the OY is fully attained each fishing year. If incursions into the RCAs occur, the estimated total mortality would likely be underestimated and the risk of exceeding the OYs for overfished species increased, with the risk being greatest for species most frequently encountered by the OA gears (bocaccio, lingcod, yelloweye rockfish and canary rockfish), which the RCAs are intended to protect. If the true discard rates are higher than the discard assumptions used to estimate total catch, the OYs could unknowingly be exceeded. If the OYs are substantially exceeded, a stock's ability to rebuild could be impaired. If a rebuilding deficit is created for an overfished stock because the OY is repeatedly and unknowingly exceeded, the stock may not be able to recover within the specified rebuilding time. For stocks in the precautionary zone (B25%-B40%), the stock biomass could be further reduced, possibly leading to an overfished status.

Indirect impacts from fishery management actions include changes in fishing practices that affect the biological environment, but are further away in time or location than those occurring as a direct impact. The prohibition of fishing in certain areas or during certain times is used to reduce overall fishing effort and to protect vulnerable populations. When depth-based RCA management was adopted, large areas of the continental shelf were closed to groundfish fishing to protect overfished species. This was expected to result in effort shifts to open areas that are shoreward and seaward of the conservation areas. Over time, area management involves closing and sometimes opening formerly closed areas. When the size or location of closed areas change, the fishing fleet makes shifts in fishing effort. Knowing when and where fishing is occurring is necessary for: understanding total fishing mortality; evaluating possible impacts on the adult and juvenile groundfish species, assessing impacts with non-groundfish species, and determining if regulatory changes are needed.

Commercial data is primarily in the form of landing receipts or "fish tickets," which are filled out by fish buyers at the time of delivery from a fishermen. Fish tickets are a major source of information on the amount of fish and which provide information on the total weight landed by species or market categories,

price per pound, and the condition of the catch. Little specific information on fishing locations is available for the OA fleet. Therefore, little is known about fishing patterns in the West Coast groundfish OA fishery or how fishing effort shifts from closed areas to the remaining open fishing areas.

Logbooks are a useful tool for verifying landing receipts and for tracking fishing activity. The information recorded in logbooks typically consists of date, boat name and identification number, crew size, catch location, numbers or pounds of fish, gear type used, mesh size, principle target species, associated species taken and landing receipt number. Logbook data is not available from the directed OA fisheries at this time, but are for a few incidental fisheries such as the California gill and trammel nets, traps, and trawl gear fisheries. Without effort data, estimates of catch per unit of effort (CPUE) cannot be made. CPUE is the number or weight of fish caught per unit of effort. Typically, effort is evaluated by gear type, gear size, and length of time the gear is used. CPUE can be used as a measure of relative abundance for a particular species and can be used to understand abundance changes over time. VMS can aid in estimating CPUE based on fishing location and days at sea.

VMS systems provide accurate harvest location data that could be used to estimate the distribution of fishing effort throughout the WOC. Hourly position reports allow changes in fishing location and intensity to be monitored and assessed, they also allow the number of vessel trips to be verified. Because VMS would be required to be operated continuously after a vessel fishes in the OA fishery in Federal waters, data from additional non-groundfish fisheries off the West Coast may also be available. When VMS position information can be combined with data collected by at-sea observers it can be used to better understand the impacts of the effort shift on adult and juvenile populations. Overfished species bycatch estimates may be refined with VMS data. The response time for management to address unintended impacts on stocks resulting from effort shifts could be improved with VMS. However, the ability to understand the extent of the impacts resulting from effort shifts on groundfish and other resources would depend on the amount, availability and applicability of other data such as at-sea observer data for the different gears and sectors of the OA fishery.

Comparison of the Alternatives The level of fleet coverage, that portion of the overall OA fishing fleet that would be required to have VMS and provide declaration reports, is the primary difference between the alternatives. Each of the alternatives defines the portion of the OA fleet that would be required to carry and use VMS transceivers and provide gear declaration reports. Alternative 10 is the only alternative that goes beyond VMS coverage by discontinuing the non-trawl and trawl RCA requirements for the OA fisheries.

Alternative 1, Status Quo, would continue the requirement for declaration reports from OA vessels using nongroundfish trawl gear in the RCAs. Under Alternative 1, OA fishery position data would only be available from vessels who voluntarily use VMS units and from vessels that fish pursuant to the OA regulations, but carry VMS because the vessel is registered to a LE permit. Under Alternative 1, a higher level of fishing mortality than that being used to estimate total catch may result if the integrity of closed areas are not maintained and incursions result in higher rates of overfished species catch than projected. The difficulty in maintaining the integrity of closed areas is greatest under status quo, Alternative 1.

Alternative 2 maintains the declaration provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 322 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut) that use longline gear to take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the OA fleet (only vessels using longline gear) to have and use VMS and therefore provides the least amount of data for monitoring the integrity of the RCAs or for assessing fishing effort and intensity relative to fishing fleet activity. The risk to overfished species as a result of incursions into the RCAs is reduced for the directed vessels using longline gear. Table 3.3.3.7 shows the projected catch of overfished species for 2005 for the OA directed groundfish and incidental fisheries. The Pacific halibut longline fishery is one of the incidental fisheries with the greatest potential impacts on overfished species if incursions into the RCA occur. The Pacific halibut fishery is projected to take 1.92% of the yelloweye rockfish OY with the RCAs being maintained. Having VMS to maintain the integrity of the RCAs in relation to Pacific halibut longline vessels will reduce the risk of exceeding the yelloweye rockfish OY as a result of Pacific halibut vessel incursions into the RCAs. Data collected from the longline vessels can be combined with observer, survey, and fish ticket data to better

estimate: 1) total fishing mortality, 2) impacts on juveniles and other fishery resources related to changes in fishing locations and intensity, 3) fishing intensity (amount of time vessels are in an area), and 4) changes in fishing location and intensity over time. Given the mobility of vessels within the fishery, directed longline vessels could choose to change gears to avoid the VMS requirements.

Approximately 515 vessels would be required to have VMS under Alternative 3. Alternative 3, includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead) using pot gear to take and retain, possess or land groundfish. The addition of the pot gears to the VMS program under Alternative 3 will aid in maintaining the integrity of RCAs. Therefore, the risk to overfished species, as a result of incursions into the RCAs is reduced for the directed vessels using longline and pot gear. Table 3.3.3.7 shows the projected catch of overfished species for 2005 for the OA directed groundfish and incidental fisheries. When considering the impacts of the incidental pot fisheries on overfished species, the California sheephead pot fishery and the spot prawn trap fishery would be considered the lowest impact OA fisheries because no overfished species fishing mortality is projected for these fisheries, and the Dungeness crab pot fishery with 0.5 mt of lingcod (0.02% of the lingcod OY) would have only slightly greater impacts on overfished species. Some fisheries encounter fewer overfished species because the target species and the overfished species do not co-occur or occur in low abundance, or because the fishing gear is designed in a way that captures the target species but does not capture the overfished species. For such incidental fisheries, the potential risk of incursions into the RCAs (when incidental groundfish is retained or targeted within the RCA) is lower than for fisheries where the target species co-occur with overfished species or are vulnerable to the fishing gear. Table 3.3.3.1 shows that the groundfish landings in the Dungeness crab fishery and the prawn pot fisheries were very low between 2000 and 2004 (less than 0.3 mt per year). The groundfish landings by vessels targeting California sheephead were somewhat higher (2.0 in 2000, 4.8 in 2001, and 0.7 in 2003) in the years before RCAs were created. Similar to Alternative 2, under Alternative 3, some vessels may change to line gear to avoid the VMS requirements.

Alternatives 4A and 4B add VMS coverage for nongroundfish trawl vessels to the pot and longline vessels identified under Alternative 3. The primary difference between Alternatives 4A and 4B is that Alternative 4A adds the VMS and declaration reporting requirement for approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels) using nongroundfish trawl gear. While Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4A plus 54 pink shrimp vessels. Many vessels that fish for pink shrimp are also registered to LE groundfish permits and therefore already have VMS requirements. Alternative 4B adds those pink shrimp vessels that are not also registered to LE groundfish permits. Approximately 646 vessels would be required to have and use VMS under Alternative 4B. The nongroundfish trawl fisheries with the greatest impacts on overfished species include the pink shrimp and California halibut trawl (overfished species impacts were not provided by gear type) fisheries (Table 3.3.3.1). The California Halibut trawl fishery has a specific RCA defined for the fishery. The risk of actual catch of overfished species exceeding the OYs as a result of RCA incursions by California halibut vessels is reduced with VMS. RCA areas have also been defined for California sea cucumber and the ridgeback prawn trawl fishery. Under the current management regime, which includes RCAs, the sea cucumber trawl fishery would be considered the lowest impact OA trawl fisheries because no overfished species fishing mortality is projected for the fishery. The ridgeback prawn trawl fishery has a slightly greater impact with 0.1 mt of bocaccio (0.03% of the bocaccio OY) projected to be taken. Though the risk of actual catch of overfished species exceeding the OYs as a result of RCA incursions by sea cumber and ridgeback prawn trawl vessels is lower than for California halibut vessels, it is further reduced with VMS. Pink shrimp vessels must provide declaration reports when fishing within a trawl RCA, but are otherwise not subject to RCA restrictions. The effect of Alternatives 4A and 4B is the same because no overfished species catch projection would not change over current projections. Fishing effort and location data under both alternatives could provide information that can be used to better understanding groundfish mortality for trawl vessels in the same ways as identified under Alt. 2 for longline vessels.

Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 658 vessels (590 groundfish, 58 California halibut, and 10 HMS vessels) using line gear to take and retain, possess or land groundfish (excludes salmon troll vessels). In total,

alternative 5A applies to 1,250 vessels. The risk of actual catch exceeding overfished species OYs as a result if incursions into the RCAs is reduced for all directed groundfish vessels. Maintaining the integrity of the RCAs for nongroundfish trawl and line vessels will reduce the risk of exceeding the bocaccio or canary rockfish OYs as a result of California halibut vessel incursions into the RCAs. Under Alternative 5A, there is no change over Alternative 1 for HMS line vessels. Overfished species catch projections for the salmon troll fishery represent incidental fishing mortality. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish as a result of salmon troll fishing where the gear is altered or used to catch groundfish within the RCAs may be reduced. VMS data could also be used to improve managers' understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels.

Alternative 5B, includes slightly more vessels than 5A because all salmon troll vessels that land groundfish are included. HMS and Dungeness crab vessels are excluded under alternative 5B. Data from 1,453 vessels: 322 vessels using longline gear (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut); 172 vessels using pot gear (145 directed groundfish, 6 prawn, and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), and 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) can be used to maintain the integrity of RCAs. In 2005, salmon troll vessels were projected to encounter 1.6 mt or 33% of the canary rockfish taken in all OA fisheries, or 3.42% of the canary rockfish OY (Table 3.3.3.7). The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish as a result of salmon troll fishing where the gear is altered or used to catch groundfish within the RCAs may be reduced. The risks of exceeding the OYs due to incursions by Dungeness crab is relatively low. VMS data could also be used to improve managers' understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels.

Alternative 6A, applies to any vessel engaged in commercial fishing to which an RCA restriction applies. Alternative 6A would apply to the largest number of OA vessels and would therefore provide the largest amount of data for monitoring the integrity of the RCAs. Data from approximately 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear (145 directed groundfish, 6 prawn, 21 Dungeness crab and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) and 72 vessels using net gear (25 HMS and 47 CA halibut) could be used to maintain the integrity of RCAs. Unlike Alternatives 2-5B, which include only Pacific halibut vessels that take and retain, possess or land groundfish, all Pacific halibut vessels would be included under Alternative 6A. Maintaining the integrity of the RCAs will reduce the risk of exceeding the yelloweye rockfish OY as a result of Pacific halibut vessel incursions into the RCAs. There is no change over Alternative 1 for HMS line and sea cucumber vessels because they are not projected to catch overfished species. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish as a result of salmon troll fishing where the gear is altered or used to catch groundfish within the RCAs may be reduced. Alternative 6B applies to any vessel engaged in commercial fishing to which an RCA restriction applies, except salmon troll vessels fishing north of 40°10' N. lat. that land only yellowtail rockfish. Alternative 6B affects approximately 58 fewer vessels annually than does Alternative 6A. The risk of incursions into the RCAs occurring under Alternative 6B are similar to Alternative 6A, with the only difference being the ability to monitor the fishing locations of salmon troll vessels fishing in the north that retain only yellowtail rockfish. Impacts resulting from Alternative 7 are almost the same as Alternative 6A because it applies to the same vessels, except that 22 vessels less than 12 feet in length would be excluded. It is unlikely that vessels under 12 feet in length fish in Federal waters and would therefore not trigger the VMS requirement. VMS data could also be used to improve managers' understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels. The benefits of position data availability should be considered in the longer term because there is currently very little data (observer or otherwise) from OA vessels on the amounts and types of bycatch in their fisheries. In the short-term, using effort data obtained from a VMS system to estimate total catch and to monitor the attainment of OYs will be limited until more data becomes available.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn

trawl, HMS line, and California sheephead pot. Data from 1,463 vessels includes data from: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using California halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). Data from the seas cucumber, ridgeback prawn, and pink shrimp trawl vessels would not be included under Alternative 8. Therefore, the ability to maintain the integrity of RCAs from incursions with the fishing gears associated with the greatest projected catch of overfished species would result in impacts similar to Alternatives 5B-7. Because the low projected bycatch for the sea cucumber and ridgeback prawn trawl fisheries are linked to the areas which the fisheries occur, the lack of VMS for these vessels may undermine the integrity of the nongroundfish trawl RCAs that are used to managed the catch of overfished species by these vessels.

Under alternative 9 data from 1,123 vessels could be used to maintain the integrity of RCAs from longline, pot, trawl, line, net and other fishing gear impacts. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab, 2 prawn and 2 sheephead); 9 California halibut and 3 pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). Because Alternative 9 excludes those vessels with minimal annual catch of groundfish, those that land less than 500 lb of groundfish in a calendar year, it includes fewer nongroundfish trawl vessels than Alternative 8, as well as very few California halibut line gear, and salmon troll vessels. The overfished species impacts projected for the California halibut fishery are 0.03% of the bocaccio OY, 0.21% of the canary rockfish OY, and 0.08% of the lingcod OY, however these are not gear specific projections. The California halibut trawl fishery has a specific RCA defined for the fishery. The risk of actual catch of overfished species exceeding the OYs as a result of RCA incursions by California halibut vessels is greater under Alternative 9 than under Alternatives 2-3, but less than 4A-8. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish as a result of salmon troll fishing where the gear is altered or used to catch groundfish within the RCAs is likely to be reduced and is similar to Alternatives 2-5A. Small amounts of incidentally caught species may continue to be landed rather than discarded by the vessels to avoid VMS requirements. Providing managers with an opportunity to collect length and age structure data from species that may otherwise not be available.

The projected impacts resulting from Alternative 10 on overfished species catch is expected to increase for the directed fisheries, the non-groundfish trawl fisheries except pink shrimp, and the Pacific halibut fishery unless additional management measures, such as extended closed seasons, are used to seriously restrict the fishery. Little data is available to assess OA fishing location and intensity.

The OA fishery does not require participants to have permits or gear endorsements. Directed groundfish participants using fixed gear have the mobility to choose between the legal OA fixed gears for harvesting groundfish. Therefore, if VMS requirements under Alternative 2 or 3 were implemented, it will likely result in some directed groundfish participants changing gear to avoid the VMS requirements. Because a substantial proportion of the directed groundfish fleet is required to use VMS under Alternatives 4-9, the number of directed groundfish vessel operators that are likely to change gear to avoid VMS requirements is reduced. Vessels that incidentally catch groundfish while targeting other species are less likely to change gears to avoid VMS requirements. This is because the various state and federal requirements for the target fishery they are participating in generally restricts the type of gear participants can use. However, participants that catch groundfish incidentally with longline, pot, line, or net gear are not considered to be in the OA groundfish vessels unless they take and retain, possess or land groundfish. This is different from the nongroundfish trawl gear vessels. Therefore, these participants may choose to avoid the VMS requirements by not retaining groundfish, though they would continue to catch groundfish incidentally to the target fishery. The number of participants that would choose to discard groundfish to avoid VMS requirements is unknown; however, a substantial number of participants in the incidental groundfish fisheries land less than 500 lb of groundfish annually (Table 3.3.3.9) and may choose to avoid VMS requirements by discarding the groundfish catch. This type of VMS avoidance would likely occur more frequently with California halibut longline and line gear vessels, Dungeness crab pot vessels, prawn pot vessels, HMS line gear vessels, and salmon troll gear where a large number of vessels land less than 500 lb of groundfish per year. These vessels are excluded under Alternative 8 and 9. Nongroundfish

trawl vessels have less ability of avoid VMS since all vessels, regardless of whether or not groundfish are landed, are included under Alternatives 4A through 7.

4.2.2 Other Biological Resources

Non-groundfish species interactions

The action is to expand the VMS program to monitor the integrity of closed areas in relation to OA fishing activities. None of the management alternatives is expected to have an adverse effect on the incidental mortality levels of CPS, Dungeness crab, Pacific pink shrimp, Pacific halibut, forage fish or miscellaneous species over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 2- 7) may be positive because it may allow NMFS observer data and data from other sources to be joined together to derive a better understand of potential fishing related impacts on these species.

Salmonids

The action is to expand the VMS program to monitor the integrity of closed areas in relation to OA fishing activities. None of the management alternatives is expected to have an adverse effect on the incidental mortality levels of listed salmon species over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Marine Mammals

The action is to expand the VMS program to monitor the integrity of closed areas in relation to OA fishing activities The West Coast groundfish fisheries are considered Category III fisheries, where the annual mortality and serious injury of a stock by the fishery is less than or equal to 1% of the PBR level (potential biological removal for mammal species). Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Seabirds

The action is to expand the VMS program to monitor the integrity of closed areas in relation to OA fishing activities. None of the proposed management alternatives are likely to affect the incidental mortality levels of seabirds over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Sea Turtles

The action is to expand the VMS program to monitor the integrity of closed areas in relation to OA fishing activities. None of the proposed management alternatives are likely to affect the incidental mortality levels of sea turtles over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Endangered Species

Species listed under the ESA are identified in Section 3.2 of this EA. Specific discussion of species listed under the ESA can be found above in the sections titled salmonids, marine mammals, sea birds and sea turtles.

4.3 Socio-economic Impacts

This section of the EA looks at impacts, positive and negative, on the socio-economic environment. Basic information regarding the people and the fisheries that are projected to be affected by the management alternatives was presented in Section 3 of this document. The following section differs in that it discusses what is projected to happen to the affected people, what social changes are expected to occur, and, how changes are expected to affect fishing communities. Changes in harvest availability to the different sectors of the fishery, changes in income and revenue, costs to participants; the effectiveness and costs of enforcing the management measures, effects on fishing communities, and how the actions affect safety of human life at sea will be examined in the following impact analysis.

Circumstances vary substantially between OA target fisheries and gear groups. In addition, little social and economic information is available on the various OA fisheries and the participants. Therefore, it is not possible to produce a detailed cost benefit study for VMS implementation in the OA fishery. The following analysis takes a general approach by examining; the costs and benefits to the OA fishery participants that are likely to result from the alternative VMS actions relative to economic status of the fishery participants; the ecological health of the resources; the geographical nature of the fishery; the type of fishing conducted (directed or incidental); the type of gear used; the quantity and size of vessels; fisheries enforcement; the management regime; and safety of human life at-sea.

SOCIO-ECONOMIC ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
FISHERY ENFORCEMENT	Changes in the ability to enforce groundfish fishery regulations as a result of VMS regulations
Alternative 1 Status quo	Direct impact Declaration reports may aid in identifying OA trawl vessels legally fishing in conservation areas. Indirect impacts The RCAs may need to be simplified to be more enforceable.
Alternative 2 Vessels using longline gear	Direct impact Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to approximately 322 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut vessels) that take and retain, possess or land OA groundfish. Deterrent effect will likely reduce the number of area violations by vessels using OA longline gear. Can be used to target at-sea and dockside inspections of OA vessels using longline gear. Indirect impact VMS position data from 322 longline vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities, and; may be used to support enforcement actions for closed area management in the Pacific Halibut directed fishery.
Alternative 3 Vessels using longline or pot gear	In **addition** to the impacts from the 322 vessels under Alt. 2: Direct impact Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relationship to approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead vessels) vessels using pot gear that take and retain, possess or land groundfish. Deterrent effect will likely reduce the number of area violations by vessels using OA pot gear. Can be used to target at-sea and dockside inspections of OA vessels using pot gear. Indirect impact VMS position data from 322 longline and 193 pot vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities, and; may be used to support enforcement actions for closed area management in the Dungeness crab and spot prawn pot fisheries.
Alternative 4A Vessels using longline, pot or trawl gear, except: pink shrimp trawl	In **addition** to impacts from the 515 vessels under Alt. 2 and 3: Direct impact Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear to take and retain, possess or land OA groundfish. Deterrent effect will likely reduce the number of area violations by vessels using nongroundfish trawl gear. Can be used to target at-sea and dockside inspections of OA vessels using nongroundfish trawl gear. Indirect impact VMS position data from 322 longline, 193 pot, and 77 trawl (except shrimp trawl) vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities, and; may be used to support enforcement actions for closed area management in the ridgeback prawn, sea cucumber, and CA halibut fisheries excluding pink shrimp.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY ENFORCEMENT	Changes in the ability to enforce groundfish fishery regulations as a result of VMS regulations
Alternative 4B Vessels using longline, pot or trawl gear	In **addition** to impacts from the 515 vessels under Alt. 2 and 3: Direct impact Accurate and timely position data allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to approximately 131 vessels (54 pink shrimp, 23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear. Deterrent effect will likely reduce the number of area violations by vessels using nongroundfish trawl gear. No change over Alt. 4A for pink shrimp vessels because fishing in the RCA is permitted. Can be used to target at-sea and dockside inspections of OA vessels using nongroundfish trawl gear. Indirect impact VMS position data from 322 longline, 193 pot, and 131 trawl vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities, and; may be used to support enforcement actions for closed area management in the ridgeback prawn, sea cucumber, and CA halibut fisheries.
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll	In **addition** to impacts from the 592 vessels under Alt. 2, 3 and 4A, Direct impact Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to approximately 658 (590 vessels using line gear to target groundfish, 10 HMS, and 58 CA halibut OA vessels) using line gear to take and retain, possess or land groundfish. Deterrent effect will likely reduce the number of area violations by vessels using line gear. Can be used to target at-sea and dockside inspections for OA vessels using line gear. Indirect impact VMS position data from 320 longline,193 pot, 77 trawl (except shrimp trawl), and 658 line (except salmon troll) vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and may be used for closed area management in the line fisheries excluding salmon troll.
Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline, HMS line, and Dungeness crab pot gear	Direct impact Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to 1,453 vessels: 322 vessels using longline gear (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut); 172 vessels using pot gear (145 directed groundfish, 6 prawn, and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), and 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels). Deterrent effect will likely reduce the number of area violations for incidental OA fisheries including salmon fishery area management measures. Can be used to target at-sea and dockside inspections for OA vessels Indirect impact VMS position data from 320 longline (excludes 2 HSM vessels), 172 pot (excludes 21 Dungeness crab vessels), 77 trawl (excludes shrimp trawl), and 882 line (includes 234 salmon troll vessels but excludes 10 HMS vessels), may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries excluding pink shrimp, HMS longline, HMS line and Dungeness crab pot fisheries, but including salmon troll.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY ENFORCEMENT	Changes in the ability to enforce groundfish fishery regulations as a result of VMS regulations
Alternative 6A Vessels with RCA restrictions; except pink shrimp trawl	Direct impact Accurate and timely position data available from approximately 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear (145 directed groundfish, 6 prawn, 21 Dungeness crab and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) and 72 vessels using net gear (25 HMS and 47 CA halibut). Deterrent effect will likely reduce the number of area violations for OA incidental fisheries including the salmon fishery. Can be used to target at-sea and dockside inspections for all OA vessels with RCA restrictions, including salmon troll coastwide. Indirect impact VMS position data from 349 longline, 193 pot, 77 trawl, and 892 line vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions, including salmon troll.
Alternative 6B Vessels with RCA restrictions: except salmon troll north that retain only yellowtail rockfish and pink shrimp trawl	Direct impact Slightly less accurate and timely position data than identified under Alt. 6A, because 58 salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded Indirect impact VMS position data from 349 longline, 193 pot, 77 trawl, and 834 line vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions.
Alternative 7 Vessel >12 ft with RCA restriction; except, pink shrimp trawl	Direct impact Slightly less accurate and timely position data than identified under Alt. 6A because approximately 22 vessels (6 longline, 2 pot, and 14 line gear vessels <12 feet in length) fewer vessels (1,383 vessels) than those identified under Alt. 6A are excluded. Few if any of these vessels fish in Federal waters. Indirect impact VMS position data from 343 longline, 191 pot, 77 trawl, and 878 line vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal.	Direct impact Accurate and timely position data available from 1,463: 349 vessels using longline gear 282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 CA halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 CA halibut, and 234 salmon troll vessels). Deterrent effect will likely reduce the number of area violations by vessels identified under this alternative. Indirect impact VMS position data from the 1,463 vessels identified under this alt.: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY ENFORCEMENT	Changes in the ability to enforce groundfish fishery regulations as a result of VMS regulations
Alternative 9 Directed vessels, those that land more than 500 lb of groundfish in a calendar year.	Direct impact Accurate and timely position data available from 1,123 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 CA halibut and 3 pink shrimp vessels (2003-2004 avg. number)using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). Deterrent effect will likely reduce the number of area violations by vessels identified under this alternative. Indirect impact VMS position data from the 1,123 vessels identified under this alt.: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions.
Alternative 10 No Action. No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impact Enforcement of OA fishery interactions with RCAs would no longer be necessary. Indirect impact Scarce enforcement resources may be used elsewhere to monitor for potential fishery violations other than those related to the OA fishery interactions with RCAs.
Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.	

4.3.1 Fishery Enforcement

Direct impacts on enforcement from fishery management actions includes; changes in the availability of information that directly aids enforcement officers in identifying violations; changes in information that helps enforcement officers to separate those individuals who are complying with the regulatory requirements from those who are not; and changes that alter the level of compliance by fishers.

At the present time there are 8 NMFS agents covering the Pacific Coast groundfish fishery. These officers and agents are responsible for enforcing all conservation regulations in the Pacific Coast groundfish fishery (e.g. size limits, trip limits, gear restrictions, etc). They are also responsible for monitoring all other fisheries in areas that are regulated by NMFS. In addition, there are state enforcement officers in California, Oregon, and for Washington that cover the groundfish fishery as well as other state fisheries. At this time, state enforcement resources (personnel and budgets) are extremely limited.

Implementing depth-based management measures over large geographic areas marked the transition to a much greater dependence upon at-sea enforcement. Maintaining the integrity of the conservation areas is largely dependent upon the ability to enforce such management measures. In the past, fishery management measures, such as landing limits, size limits, and species landing restrictions were largely enforced by the relatively easy and inexpensive method of dockside enforcement. Enforcing depth-based closed areas represents a more costly and difficult challenge, because effective enforcement requires frequent patrolling of the shoreward and seaward boundaries of the conservation areas. The single biggest factor that allows some operators to avoid compliance with closed area management measures is that much of the fishing activity takes place out of view of anyone other than the vessel crew. Because VMS provides reliable and accurate information on the location of vessels and can be used to identify where fishing activity takes place with a reasonable degree of accuracy, VMS is a practical means of monitoring vessels activity in relation to area restrictions.

VMS will potentially show enforcement officers breaches of time/area restrictions. VMS can show officers those vessels that are following the rules as well those that are not. In doing so, it makes the activities of investigating officers much more cost effective because less time will be spent pursuing false trails and fishing operators who are following the rules. However, patrols by both sea and air will still be necessary for fully effective monitoring and management, even with an effective VMS program. A patrolling aircraft or vessel can spend considerable time and fuel investigating legitimate fishing vessels that will appear on their radar. Providing access to VMS data for patrol craft can minimize the effort spent confirming radar contacts of vessels fishing legitimately and thereby increase the efficiency of surveillance patrols. Further, identifying legitimate fishing vessels to patrol craft via VMS may help them choose particular contacts for more productive investigation when several contacts are made by radar.

In some cases, enforcement officers will have particular vessels or particular situations for which they may wish to conduct an at-sea or landing inspection without warning to the vessel operator. Without VMS, it is extremely difficult to determine where a vessel is located at-sea or where and at what time it might enter port. VMS provides a reliable means of achieving this with potential savings in time and other expense in moving officers and aircraft or patrol vessels to the correct location at the appropriate time.

Vessel position data and fishery declarations, which are otherwise not available from this sector of the groundfish fleet, would be used to identify vessels fishing in the closed areas and to target landing and at-sea inspections. Accurate and timely position data is necessary to allow enforcement resources to be used efficiently to maintain the integrity of RCAs. In addition, the deterrent effect of VMS will likely reduce the number of closed area violations.

One of the major benefits of VMS is its deterrent effect. If fishing vessel operators know that they are being monitored and that a credible enforcement action will result from illegal activity, then the likelihood of that illegal activity occurring is significantly diminished. In this context, VMS is a preventive measure rather than a cure. To be effective as a deterrent, the VMS program must maintain its credibility in the

eyes of the vessel operators and its use must be kept at the forefront of their minds if the deterrent effect is to be maintained. The credibility of the system can only be maintained if all operational issues are followed up, particularly those that affect a vessel, such as failure of the vessel to report on schedule. The presence of the VMS equipment on the vessel will be a reminder to operators of its monitoring operation.

The OA fleet consists of smaller sized vessels, with many being under 40 feet in length (Table 3.3.3.4). Smaller vessels are generally not able to withstand rough seas as well as larger vessels. Because much of the OA groundfish fleet is comprised of small vessels, much of the effort is thought to occur in waters near the seaward boundary of the nontrawl RCAs. It is presumed that fishers with smaller vessels (<40 ft) fishing seaward of the RCAs are more likely to encroach on the seaward boundary of the RCAs, because of the desire to fish nearer to shore for safety and to reduce fuel consumption and general wear and tear on the vessel. Table 4.3.1.1 shows the proportion of OA vessels by target fishery that are less than 40 feet in length. From this table, it can be seen that a large portion of the vessels that participate in the directed fisheries and who have a greater than 5% dependency on groundfish are small vessels. Many of the nearshore vessels may fish exclusively in state waters.

Table 4.3.1.1. Percent of OA vessels less than 40 feet (ft) in length, November 2000 through October 2001.

More than 5% of annual revenue from groundfish	
Target species	Vessel less than 40 ft in length
Sablefish	72%
Nearshore Rockfish	91%
Shelf Rockfish	90%
Slope rockfish	82%
Less than 5% of annual revenue from groundfish	
Sablefish	32%
Nearshore Rockfish	78%
Shelf Rockfish	60%
Slope rockfish	51%
Halibut	65%
Shrimp/prawn	21%
Dungeness crab	56%
Salmon	72%
HMS	31%
CPS	29%
Source: EIS, for the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management 2005-2006	

Indirect impacts on enforcement from fishery management actions include change in the availability of

information used for conducting further investigations or used with other sources of information to better understand compliance behavior.

VMS positions can be efficient in identifying possible illegal fishing activity and can provide a basis for further investigation by one or more of the traditional enforcement measures. VMS positions in themselves can also be used as the basis for an enforcement action. The positions may also be used to establish "probable cause" before pursuing some types of investigations, for example, in obtaining a search warrant. While not being evidence of sufficient significance by itself, VMS position data could provide sufficient evidence to lead an officer to believe that an illegal act had occurred that warrants further investigation.

Expansion of the VMS program clearly supports an enforcement mission and may also have indirect benefits to Homeland Security activities. Increased border security correlates directly with increased risk within our EEZ and along our coastline for illegal entry. In March 2002, the "Citizen Corps" initiative was announced, which includes the expansion of "Neighborhood Watch" to include the participation of ordinary citizens in detecting and preventing terrorism. Under "Coastal Watch", the Coast Guard requests fishers to report suspicious activities for investigation and intelligence purposes. Critical decisions on the deployment of enforcement assets could be based on VMS position reports. Satellite communication could also update essential information during a law enforcement response. Investigative methodologies could be enhanced via surveillance data maintained within VMS, such as easily identifying potential witnesses to incidents, locating U.S. vessels in areas of suspicious activity for assistance and support and increased intelligence gathering capabilities. By expanding the number of U.S. fishing vessels operating with VMS, NOAA and fishers are expanding the capability to detect and prevent terrorism and other criminal activity in the EEZ. VMS also supports the Coast Guard's "Coastal Watch" initiative, which was developed in response to their homeland defense activities.

Comparison of the Alternatives

VMS would not replace or eliminate traditional enforcement measures such as aerial surveillance, boarding at-sea via patrol boats, landing inspections and documentary investigation. Traditional enforcement measures may need to be activated in response to information received via the VMS. The level of VMS coverage in the OA fleet varies between the alternatives. Therefore, the degree to which a VMS program would aid enforcement in identifying vessels that are legally or illegally operating in the RCAs or benefit enforcement in conducting further investigations, would depend on the proportion of vessels required to carry and use VMS as well as the amount of time the vessels engage in fisheries in areas with the RCA restrictions.

Alternative 1 requires nongroundfish trawl vessels to provide declaration reports prior to leaving port on a trip in which fishing occurs in an RCA. Under Alternative 1, OA fishery position data would be available from vessels that voluntarily use VMS units and from vessels that fish pursuant to the OA regulations, but carry VMS because the vessel is registered to a LE permit. The greatest difficulty in maintaining the integrity of closed areas and the least efficient use of limited state and federal enforcement resources occurs under status quo, Alternative 1.

Alternative 2 maintains the provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 322 longline vessels (282 directed groundfish, 38 Pacific halibut, and 2 California halibut vessels) using longline gear to take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the OA fleet (only vessels using longline gear) to have and use VMS and therefore provides the least amount of data for monitoring incursions. If the groundfish species pursued by the directed longline vessels are in high abundance in the RCA (primarily shelf areas,) fishers may be willing to take the risk to fishing within the boundaries of the RCA particularly if the rate of detection is low. Because Pacific halibut are also found within the RCAs, some fishers may be willing to risk fishing within the RCAs, particularly if the perception of being detected is low. In recent years, the directed halibut fishery south of Point Chehalis has occurred in 3-6 one day 10 hour long openings per year. Given the short duration of the directed halibut fishery, requiring the Pacific

halibut vessels that retain groundfish to have VMS would provide a large amount of position data over a very short period of time. Some fishers, those who do not otherwise fish in the groundfish fishery and who only land small amounts of incidentally caught groundfish caught during the primary halibut season, may well choose to discard incidentally caught groundfish, rather than incur the cost of VMS and the burden of installation. HMS longline gear is currently not permitted in the EEZ off the West Coast; therefore, no additional HMS vessels over those affected by status quo would be included as a result of Alternative 2. Because the fishery occurs outside the RCA, HMS longline vessels would transit through the RCA and therefore pose a minimal risk to the integrity of the RCAs. Monitoring HMS longline vessels in relation to the RCA requirements is a lower priority to enforcement.

Alternative 3 includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for vessels using pot gear that take and retain, possess or land OA groundfish. Approximately 515 vessels, those identified under Alternative 2 plus approximately 193 vessels using pot gear (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead) would be included under Alternative 3. Alternative 3 would provide more data position reports than Alternative 2, however it would provide fewer position reports than Alternative 4A. A small proportion of the Dungeness crab vessels, less than 3% (21 vessels per year out of 801 vessels per year), land the groundfish incidentally taken during the Dungeness crab season. Landing groundfish taken in Dungeness crab pots is not allowed in the states of Washington and XXOregonXX. The Dungeness crab fishery primarily occurs in depths between 5-100 fathoms of water. When the nontrawl RCAs extend from shore to 100 fm, any groundfish retained by a pot vessel fishing for Dungeness crab would be required to have been caught seaward of the 100 fm line. In addition, regulations prohibit vessels from fishing both shoreward and seaward of the RCA on the same trip. VMS could be used to determine if all fishing on a trip in which groundfish was retained occurred seaward of the RCA, or if fishing actually occurred within the RCA on trips in which groundfish was landed. Because few if any vessels target Dungeness crab offshore of 100 fm, Alternative 3 is expected to affect few Dungeness crab vessels. This would not be an issue for nontrawl RCA areas that are defined by a shoreward fathom curve that is seaward of areas where Dungeness crab fishing occurs. VMS would aid enforcement in maintaining the integrity of the shoreward boundary. However, Table 3.3.3.9 shows that the majority of Dungeness crab vessels landing groundfish between 2000 and 2004 have landed less than 100 lb of groundfish in an entire year. Therefore, it is likely that many if not all of the 21 vessels per year that land groundfish, would discard the groundfish to avoid the VMS requirements. Between 2000 and 2004, Table 3.3.3.1 shows that these vessels landed about 0.3 mt of groundfish with an exvessel value of 1,104 per year.

The California nearshore fisheries include vessels that use traps or pot gear to harvest species managed under the groundfish plan as well as non-groundfish such as California Sheephead and Scorpionfish. Of the 68 vessels per year that landed sheephead, 21 vessels retained OA groundfish. Because the nearshore fishery primarily occurs in state waters, it is likely that many of these vessels would not be subject to the VMS requirements; therefore, no VMS position data would be available to enforcement from these vessels. The OA nontrawl RCA between 40°10 and 34°27 N. lat. has a seaward boundary of 150 fm year-round and a shoreward boundary of 20 fm during the summer (May-August) and 30 fm for the remainder of the year. Similarly, the proposed OA nontrawl RCA south of 34°27 N. lat. has a seaward boundary of 150 fm year-round and a shoreward boundary of 60 fm throughout the year. When the shoreward boundary is deeper than 20 fm, it is likely that some vessels will enter the EEZ to fish and be required to carry VMS for the remainder of the year. During the period when the fishery is constrained to 20 fm, there may be a greater incentive for some fishers to harvest nearshore species in deeper water. VMS would be an effective deterrent to illegal fishing in the RCAs. Traditional enforcement measures will likely continue to be the dominant enforcement tool used for monitoring the integrity of the RCAs shoreward line, particularly north of 34°27 N. lat. In the area south of 34°27 N. lat, there may be more incentive for vessels to fish in the EEZ because the shoreward boundary of the RCA extends further into the EEZ. Between 2000 and 2004, Table 3.3.3.1 shows that the California sheephead vessels landed about 1.5 mt of groundfish per year with an exvessel value of $14,558 per year.
Of the 28 vessels per year that landed prawns taken with pot gear, 6 vessels per year retained OA groundfish. Between 2000 and 2004, Table 3.3.3.1 shows that these vessels landed about 0.1 mt of

groundfish per year with an exvessel value of $949 per year. Table 3.3.3.9 shows that the amount of groundfish landed by prawn vessels between 2000 and 2004 varied, with most vessels landing less than 500 lb per year. However, between 1 and 4 vessels per year landed more than 500 lb of groundfish per year. It is likely that most if not all of the vessels that land less than 500 lb per year of groundfish, would discard the groundfish to avoid the VMS requirements.

Alternatives 4A and 4B add VMS coverage for nongroundfish trawl vessels to those vessels identified under Alternative 3. The primary difference between the two alternatives is that Alternative 4A excludes pink shrimp and adds the VMS and declaration reporting requirement for approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels) using nongroundfish trawl gear. Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4B, plus 54 pink shrimp vessels. Many vessels that fish for pink shrimp are also registered to LE groundfish permits and therefore already have VMS requirements. Alternative 4B adds those pink shrimp vessels that are not also registered to LE groundfish permits. Having VMS would be expected to be an effective deterrent and aid enforcement in maintaining the integrity of the shoreward line of the RCAs. Because the overfished species impacts projected for the California halibut fishery are 0.03% of the bocaccio OY, 0.21% of the canary rockfish OY, and 0.08% of the lingcod OY, the fishery was considered a higher impact OA incidental fishery. The ridgeback prawn trawl fisheries is considered to have slight impacts on overfished species (defined as those fisheries that take only a single overfished species, with small amounts by weight and proportion of the available OY -less than 0.05%,) given the current management regime, which includes RCA management. Similarly, the sea cucumber trawl fishery is considered one of the lowest impact OA fisheries because no overfished species catch is projected under the current management regime which includes RCAs. Alternative 4B results in no change over Alternative 4A for monitoring incursions into the RCAs because pink shrimp vessels are permitted to fish in the RCA.

Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 1,250 vessels, those identified under Alternatives 2, 3,and 4 plus 590 directed groundfish, 58 California halibut, and 10 HMS vessels using line gear to take and retain, possess or land groundfish(excludes salmon troll vessels). During the period when the fishery is constrained to 20 fm there may be a greater incentive for some fishers to harvest in deeper water. VMS would be an effective deterrent to illegal fishing in the RCAs. As stated above, traditional enforcement measures will likely continue to be the dominant enforcement tool used for monitoring the integrity of the RCA shoreward line, particularly north of 34°27 N. lat. In the area south of 34°27 N. lat, there may be more incentive for vessels to fish in the EEZ because the shoreward boundary of the RCA extends further into the EEZ. Alternative 5B includes slightly more vessels than 5A at 1,453. Although 10 HMS line and 21 Dungeness crab vessels are excluded under Alternative 5B, 234 salmon troll vessels are included. The inclusion of line vessels more than doubles the number of vessels that would be required to have and use VMS. Though this is a large increase in vessels, the system developed for LE vessels already has the capacity to process these position data. Table 3.3.3.9 shows that the majority of line vessels landing groundfish in the OA incidental fisheries using HMS line, California halibut line and the salmon troll gear between 2000 and 2004 have landed less than 100 lb in an entire year. Therefore, it is likely that many of these vessels would discard the groundfish to avoid the VMS requirements.

In general, VMS is an efficient enforcement tool for monitoring if a fishing trip occurred entirely inside or outside an RCA. Using VMS in this way would allow enforcement to determine which cumulative trip limits applied to a particular vessel. However, for salmon troll vessels north of 40°10 N. lat., there has been an allowance to retain yellowtail rockfish only on a trip that occurred both inside and outside and RCA. VMS would be most suited for monitoring cumulative trip limits of groundfish species other than yellowtail rockfish taken and retained by salmon troll vessels north of 40°10 N. lat.

Alternative 6A, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of OA vessels, 1,583 vessels. Therefore, Alternative 6A would provide the largest amount of data for enforcement purposes. Including most vessels in the VMS program could be expected to result in time savings for officers in the field and allow them time to conduct more

focused investigations than would otherwise be possible. Alternative 6B affects approximately 1,525 vessels annually, 58 fewer than does Alternative 6A. Alternative 7 is essentially the same as Alternative 6A, 1,561 vessels, because it applies to the same vessels except that vessels less than 12 feet in length would be excluded. Most if not all of the 22 vessels that are under 12 feet in length are unlikely to fish in Federal waters and would therefore not trigger the VMS requirement.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, and California sheephead pot. Data from 1,463 vessels includes data from: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels) would be available to enforcement. Data from the sea cucumber, ridgeback prawn, and pink shrimp trawl vessels would not be included under Alternative 8. The enforcement benefits of this alternative are similar to Alternative 6A except that the exclusion of many nongroundfish trawl vessels where there are specific RCA requirements may result in undetected incursions, with the exception of the pink shrimp fishery.

Because Alternative 9 excludes those vessels with minimal annual catch of groundfish, those that land less than 500 lb of groundfish in a calendar year, it includes fewer nongroundfish trawl vessels than Alternative 8. Under Alternative 9, data from 1,123 vessels could be used to maintain the integrity of RCAs from longline, pot, trawl, line, net and other fishing gear impacts. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 California halibut 3and pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). Many of the longline, pot, and line gear vessels that may choose to avoid VMS by discarding bycatch would be excluded under Alternative 9. Therefore the actual benefit to enforcement is similar to Alternatives 5A-7 for these vessels. The exclusion of many nongroundfish trawl vessels may also result in undetected incursions, with the exception of the pink shrimp fishery for which there are no RCA requirements. The benefit to enforcement for nongroundfish trawl is similar to Alternatives 1-3 for these vessels.

Alternative 10, the no action alternative, would have no VMS requirements, but the use of RCA management would be discontinued and management measures such as trip limits and closed seasons would be used to reduce the catch of overfished species. Enforcement of OA fishery interactions with RCAs would no longer be necessary. Scarce enforcement resources may be used elsewhere to monitor for potential fishery violations other than those related to the OA fishery interactions with RCAs.

The OA fishery does not require participants to have permits or gear endorsements. Directed groundfish participants using fixed gear have the mobility to choose between the legal OA fixed gears for harvesting groundfish. Therefore, if VMS requirements under Alternative 2 or 3 were implemented, it will likely result in some directed groundfish participants changing gear to avoid the VMS requirements. Because a substantial proportion of the directed groundfish fleet is required to use VMS under Alternatives 4-9, the number of directed groundfish vessel operators that are likely to change gear to avoid VMS requirements is reduced. Vessels that incidentally catch groundfish while targeting other species are less likely to change gears to avoid VMS requirements. This is because the various state and federal requirements for the target fishery they are participating in generally restricts the type of gear participants can use. However, participants that catch groundfish incidentally with longline, pot, line, or net gear are not considered to be in the OA groundfish vessels unless they take and retain, possess or land groundfish. This is different from the nongroundfish trawl gear vessels. Therefore, these participants may choose to avoid the VMS requirements by not retaining groundfish, though they would continue to catch groundfish incidentally to the target fishery. The number of participants that would choose to discard groundfish to avoid VMS requirements is unknown; however, a substantial number of participants in the incidental

groundfish fisheries land less than 500 lb of groundfish annually (Table 3.3.3.9) and may choose to avoid VMS requirements by discarding the groundfish catch. This type of VMS avoidance would likely occur more frequently with California halibut longline and line gear vessels, Dungeness crab pot vessels, prawn pot vessels, HMS line gear vessels, and salmon troll gear where a large number of vessels land less than 500 lb of groundfish per year. These vessels are excluded under Alternatives 8 and 9. Nongroundfish trawl vessels have less ability of avoid VMS since all vessels, regardless of whether or not groundfish are landed, are included under Alternatives 4A through 7.

SOCIO-ECONOMIC ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
FISHERY MANAGEMENT	Changes to how the fisheries are managed as a result of the collection of VMS position data
Alternative 1 Status quo	Direct impact The use of area management regulations may need to be simplified, or buffers around closed areas added so the integrity of closed areas can be maintained. The use of management regulations that limit the duration or number of trips are less likely to be considered without adequate monitoring mechanisms. Indirect impact Little position and effort data is available from OA fisheries. Without adequate position and effort data, the use of observer and survey data for refining OA fishery total catch estimates for inseason management is limited. Non-groundfish fisheries continue to occur in the RCA, but incidental groundfish landings other than yellowtail rockfish in the salmon troll fishery north of 40°10' N. lat. cannot be retained or landed. Similarly, if a vessel fishes in the RCA on a trip, groundfish cannot be retained from areas outside the RCAs on the same trip. Some vessels may misreport catch for areas other than where it was caught.
Alternative 2 Vessels using longline gear	Direct impact VMS would allow for greater flexibility in the use of management rules with geographical area restrictions including: seasonal access, closed areas, depth restrictions, limited by duration, or number of trips for approximately 320 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut OA vessels) using longline gear to take and retain, possess or land OA groundfish. VMS will provide accurate longline fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut management. Indirect impact Increased OA longline position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. VMS may result in increased bycatch and lost landings data if incidental groundfish catch by Pacific halibut vessels is not retained. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements. HMS longline gear is currently prohibited in EEZ.
Alternative 3 Vessels using longline or pot gear	In **addition** to impacts from the 322 vessels identified under Alt. 2: Direct impact VMS would allow for greater flexibility in the use of management rules for approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead vessels) using pot gear to take and retain, possess or land OA groundfish. VMS will provide accurate pot and longline fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, possibly Dungeness crab, prawn, and CA nearshore species management. Indirect impact Increased longline and pot position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY MANAGEMENT	Changes to how the fisheries are managed as a result of the collection of VMS position data
Alternative 4A Vessels using longline, pot or trawl gear, except pink shrimp trawl	In **addition** to impacts from the 515 vessels identified under Alt. 2 and 3: Direct impact VMS would allow for greater flexibility in the use of management rules for approximately 23 ridgeback prawn, 14 sea cucumber and 40 CA halibut OA vessels using nongroundfish trawl gear take and retain, possess or land OA groundfish. VMS will provide accurate pot, longline and nongroundfish trawl (except pink shrimp) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, and CA nearshore species management, prawn, sea cucumber, and CA halibut management. Indirect impact Increased longline, pot and nongroundfish trawl position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs.
Alternative 4B Vessels using longline, pot or trawl gear	In **addition** to impacts from the 515 vessels identified under Alt. 2 and 3: Direct impact VMS would allow for greater flexibility in the use of management rules for approximately 646 vessels: 131 vessels (54 pink shrimp, 23 ridgeback prawn, 14 sea cucumber and 40 CA halibut) using nongroundfish trawl gear. VMS will provide accurate pot, longline and nongroundfish trawl fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, and CA nearshore species management, prawn, sea cucumber, and CA halibut management. No change over Alt.4A for pink shrimp vessels. Indirect impact Increased longline, pot and nongroundfish trawl position and effort data from 646 vessels could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs.
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll.	In **addition** to impacts from the 592 vessels identified under Alt. 2, 3, and 4: Direct impact VMS would allow for greater flexibility in the use of management rules for approximately 658 vessels (590 groundfish, 58 CA halibut, and 10 HMS vessels) using line gear to take and retain, possess or land OA groundfish. VMS will provide accurate pot, longline, nongroundfish trawl (except pink shrimp), and line gear (except salmon troll) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, and CA nearshore species management, prawn, sea cucumber, HMS and CA halibut management. Indirect impact Increased longline, pot and nongroundfish trawl position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY MANAGEMENT	Changes to how the fisheries are managed as a result of the collection of VMS position data
Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline & line, and Dungeness crab pot gear.	Direct impact 1,453 vessels: 322 vessels using longline gear (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut); 172 vessels using pot gear (145 directed groundfish, 6 prawn, and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), and 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll), and will thereby help to maintain the integrity of data used for groundfish management and possibly salmon management. VMS will provide accurate pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, prawn, and CA nearshore species, prawn, sea cucumber, and CA halibut management. Indirect impact VMS data from vessels identified under Alt. 2, 3, 4, and 5A (excluding Dungeness crab and HMS vessels) plus approximately 234 salmon troll vessels could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.
Alternative 6A Vessels with RCA restrictions	Direct impact VMS would allow for greater flexibility in the use of management rules for 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear identified under Alt. 3; vessels using trawl gear (approximately 32 ridgeback prawn, 14 Sea cucumber, and 34 CA halibut vessels); 892 vessels using line gear as identified under Alt. 5B (includes salmon troll coastwide); and 72 vessels using net gear (25 HMS and 47 CA halibut). VMS would allow for greater flexibility in the use of management rules for pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll), and will thereby help to maintain the integrity of data used for groundfish management and possibly salmon management. VMS will provide accurate pot, longline, nongroundfish trawl (except pink shrimp), and line gear fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut management, Dungeness crab, prawn, HMS, CA nearshore species, salmon, sea cucumber, and CA halibut management. Indirect impact Increased position and effort data from 1,583 vessels: 349 vessels using longline gear are included (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear identified under Alt. 3; all vessels using trawl gear (approximately 32 ridgeback prawn, 14 Sea cucumber, and 34 CA halibut vessels); 892 vessels using line gear as identified under Alt. 5B (includes salmon troll coastwide) to take and retain, possess or land OA groundfish; vessels using net gear (approximately 3 CPS vessels); and 4 vessels using other OA gears. Data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY MANAGEMENT	Changes to how the fisheries are managed as a result of the collection of VMS position data
Alternative 6B Vessels with RCA restrictions except salmon troll north that retain only yellowtail rockfish	Direct impact VMS would allow for greater flexibility in the use of management rules for slightly fewer vessels than those identified under Alt. 6A, because 58 salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. VMS will provide slightly less data than Alt. 6A and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, HMS, CA nearshore species, sea cucumber, CA halibut and salmon management (excluding salmon troll vessels fishing north of 40°10' N. lat.) Indirect impact VMS would decrease position and effort data for slightly fewer vessels than those identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. Fewer salmon vessels would be expected to discard groundfish to avoid VMS requirements.
Alternative 7 Vessel >12 ft with RCA restrictions	Direct impact VMS would allow for greater flexibility in the use of management rules for slightly less vessels than those identified under Alt. 6A. Approximately 22 vessels under 12 ft in length would be excluded. VMS will provide slightly less data than Alt. 6A and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, HMS, CA nearshore species, sea cucumber, CA halibut and salmon management (excluding salmon troll vessels fishing north of 40°10' N. lat.) Indirect impact Similar to those impacts identified under Alt.6A. because 22 vessels under 12 ft in length would be excluded. Few if any of these vessels are expected to fish in Federal waters.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal.	Direct impact Includes data from 1,463 vessels: 349 vessels using longline gear 282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 CA halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 CA halibut, and 234 salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for vessels identified under this alternative. For the incidental OA vessels identified under this alternative, accurate VMS fishing location data may be beneficial to the nongroundfish target fisheries management. Indirect impact Increased position and effort data from 1,463. Data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.
SOCIO-ECONOMIC ENVIRONMENT - Continued	

FISHERY MANAGEMENT	Changes to how the fisheries are managed as a result of the collection of VMS position data
Alternative 9 Directed vessels. those that land more than 500 lb of groundfish in a calendar year.	Direct impact Includes data from 1,123 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 CA halibut and 3 pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for vessels identified under this alternative. For incidental OA vessels identified under this alternative, accurate VMS fishing location data may be beneficial to the nongroundfish target fisheries management. Indirect impact Increased position and effort data from 1,123. Data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs.
Alternative 10 No Action. No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impact The use of RCA management would be discontinued and management measures such as trip limits and closed seasons would need be used to reduce the catch of overfished species. Keeping overfished catch within the OY may required extensive closures. Indirect impact Little data available to managers to assess OA fishing location and intensity.
Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.	

4.3.2 Fishery Management

Direct impacts on fishery management actions include changes in the availability of information that directly aids fishery managers in administering time/areas restrictions. These restrictions typically include: seasonal access restrictions to resources, closed area management, depth restrictions, trip duration restrictions, or limits on the number trips. Deterring misreporting of catch for areas other than where fish were caught is also a direct effect on management because accurate information is needed to maintain the integrity of data used for management decisions made during the fishing season.

When there is a high degree of error or potential non-compliance associated with time/area restrictions, meeting management objectives is more difficult. Therefore, managers must be more conservative in order to meet harvest objectives. Having greater flexibility in the use of management rules with time/area restrictions is advantageous because it allows managers to deal with harvest issues on a refined level, rather than having to be more conservative to buffer for greater error or potential non-compliance. If problems can be identified early, prompt action can be taken to minimize the impacts on the groundfish fleet or the stock. For example, if fishing effort by some or all sectors of the fishery shifts to areas where data indicates that higher bycatch are likely, preseason projections may be inaccurate. If managers can identify such shifts, they may be able to restrict access to areas of high bycatch to keep overall catch within the harvest specifications.

Some mis-reporting and transcription errors can be addressed using VMS. Misreporting of catch directly undermines efforts to manage fisheries properly and impedes progress toward the goal of sustainable fisheries. Deterring the misreporting of catch taken in areas other than where fish were caught helps to maintain the integrity of data used for management decisions.

When linked with a personal computer, laptop or data terminal, VMS systems with 2-way communications (currently 2-way systems are not required in the groundfish fishery) can provide commercial fishers with the opportunity to report catch information electronically to home offices and fisheries managers. Under VMS, detailed commercial catch data and details of specific areas fished (provided by GPS) could be recorded using on-board computers or a mobile terminal and transmitted directly to a central database. The central database could be programmed to analyze the aggregate data from all vessels as it is received, thereby enabling the performance of the fishery to be monitored in 'real time', allowing more effective and timely fisheries management strategies to be developed. Satellite technology has the potential to quickly transform fisheries management from being reactive, based on limited historical data, to a pro-active process involving decisions based on analysis of real time data about the fishery. Fisheries management strategies are underpinned by catch data supplied by fishers and processors. There is usually a substantial delay before fish tickets, the primary information source to assess fishing activities, is received, analyzed and available in a format suitable for use by fisheries managers.

Indirect impacts on fishery management include change in the availability of information used as a basis for making management recommendations and decisions that are more distant in time. VMS position data along with data from other sources may be combined and analyzed to better understand the effectiveness of management actions at achieving the intended results and to make recommendations for future measures.

Typically, fisheries management rules are designed to achieve sustainable and profitable fishing through a variety of methods. This usually includes some form of licensed vessel access to particular areas, restrictions on gear types, restrictions on fishing time, quotas on the amounts of particular species that may be caught, etc. Fishery management is most effective when catch in the fishery can be quantified and measured. This means measuring the quantity of fish being caught and identifying the place where the fish are caught. VMS does not provide information on the quantity of fish being caught nor does the system being proposed for the OA groundfish fishery require that the VMS system be used as a means of communicating catch information, though some VMS transceivers can be used as a communication tool. VMS does, however, clearly make it possible to improve the availability of data in relation to the location of fish catch.

Data gathered from commercial fisheries are needed to assess the effectiveness of management regulations. Logbooks, landing surveys, VMS, and observers are different fishery dependent methods used to collect data on harvest location. Interception at sea by an independent vessel can also be used to obtain harvest location data. The cost of collecting data directly from fishery participants tends to be lower than collecting the data from an independent source. This is because it is a byproduct of the fishing activity. Some forms of fishery dependent data, particularly unverified logbooks and landing surveys, are more subject to bias than other methods and their collection and use in measuring the effectiveness of management measures requires added care such as verification procedures. Alternatives 2 -7 provide for expanded VMS coverage that has the potential of producing reliable and useful position data for assessing the effectiveness of OA fishery management measures relating to time and area management. At a minimum, the data can be used to efficiently monitor fishing location and to verify times and dates for the OA fleet where logbook data is generally not available. It can also be used to provide information on days at sea and effort by area. When combined with observer data, broader interpretations of position data may be possible.

Understanding where fishing effort is occurring in real time may provide insight into understanding information reported on fish tickets and be useful in understanding how management measures affect fishing behavior. Knowing where a vessel is fishing, as compared to where the catch is being landed, may be valuable in assessing the effectiveness of trip limit management lines and differential trip limits. The data provided by VMS are cost effective and accurate over large geographical areas. Accurate and timely data on fishing locations are necessary to assess effectiveness of closed areas and the overall results of the management scheme.

VMS data can be combined with observer data to assess the effectiveness of management measures. However, the value in combining observer data with VMS data for non-enforcement purposes depends on the amount of observer data on catch and discards that is available from the different gears and fishing strategies. At this time, there is little data on the OA fisheries. In the long term, when observer data becomes available, VMS may provide information that results in a better understanding of fishery location and a spatial understanding of fish stocks.

As noted above, electronic logbooks have been developed that can be integrated with VMS transceivers with two-way communications. If electronic logbooks could be combined with a VMS system for all or a portion of the OA fisheries, there would be several indirect benefits to management and to the quality and availability of information on which management decisions are based. First, there is only a single data entry function and this can be performed very soon after each fishing operation is completed (at-sea or shoreside depending on the individual fishery). Paper logbooks must first be filled out by the fisher and then submitted to a government agency for data entry before logbook data can be used. In performing the data entry function, the fisher will interact directly with the editing checks for the data and a more complete and accurate data record can be required before the data record is accepted by the computer system. Having electronically recorded the data, the operator may produce a hard copy and also transmit the data to the fisheries agency or other recipients such as the fishing company, allowing that data to be easily incorporated into appropriate databases. As a result, improvements in timeliness, accuracy and reduced costs are possible. When the data is in the database and available to be analyzed, it can be used to improve the ability of managers to measure the effectiveness and economic impacts of management measures.

Comparison of the Alternatives

The level of fleet coverage, that portion of the overall OA fishing fleet that would be required to have VMS and provide declaration reports, is the primary difference between the alternatives. Each of the alternatives defines the portion of the OA fleet, that would be required to carry and use VMS transceivers and provide gear declaration reports. Alternative 10 is the only alternative that goes beyond VMS coverage by discontinuing the non-trawl and trawl RCA requirements for the OA fisheries.

Alternative 1 requires nongroundfish trawl vessels to provide declaration reports prior to leaving port on a

trip in which fishing occurs in an RCA. Under Alternative 1, the least amount of data would be available to support a flexible management regime or to deter misreporting of catch. However, this is the alternative that is most likely to result in incidentally caught groundfish being retained because the added cost for retaining incidentally caught groundfish is minimal and may be used to offset the cost of the fishing trip for the target species.

Alternative 2 maintains the declaration provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 322 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut) vessels using longline gear to take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 would require the smallest proportion of the OA fleet (only vessels using longline gear) to have and use VMS and therefore provide the least amount of data that can be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. VMS may result in increased bycatch and lost landings data if incidental groundfish catch by Pacific halibut vessels is not retained. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements. Given the mobility of vessels within the fishery, directed longline vessels could choose to change gears to avoid the VMS requirements. VMS will provide accurate longline fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut management. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.

Alternative 3, includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 193 vessels (145 directed, 21 Dungeness crab, and 6 prawn, 21 CA sheephead) using pot gear to take and retain, possess or land OA groundfish. Therefore, Alternative 3 would provide more data than Alternative 2; however, it would provide less data than Alternative 4A. The addition of the pot gears to the VMS program will allow for greater flexibility in the use of management rules for vessels using pot gear that take and retain, possess or land OA groundfish. VMS will provide accurate pot and longline fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, possibly Dungeness crab, prawn, and CA nearshore species management. Similar to Alternative 2, under Alternative 3, some vessels may change to line gear to avoid the VMS requirements. Table 3.3.3.9 groups vessels into weight categories (less than 100 lb per year, 101-500 lb per year, 500-1000 lb per year, and more than 1000 lbs per year) based on the annual weight of groundfish landed between 2000-2004. Table 3.3.3.9 shows that the majority of Dungeness crab vessels landing groundfish between 2000 and 2004 have landed less than 100 lb in an entire year. Therefore, it is likely that most if not all of the 21 vessels per year that land groundfish would discard the groundfish to avoid the VMS requirements. Between 2000 and 2004, Table 3.3.3.1 shows that Dungeness crab vessels landed about 0.3 mt of groundfish per year with an exvessel value of $1,104.

Alternatives 4A and 4B add VMS coverage for nongroundfish trawl vessels to the vessels identified under Alternative 3. The primary difference between the 2 alternatives is that Alternative 4A adds the VMS and declaration reporting requirement for approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels) using nongroundfish trawl gear that take and retain, possess or land groundfish. Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4A plus 54 pink shrimp vessels. Many vessels that fish for pink shrimp are also registered to LE groundfish permits and therefore already have VMS requirements. Alternative 4B adds those pink shrimp vessels that are not also registered to LE groundfish permits. VMS would allow for greater flexibility in the use of management rules for vessels using nongroundfish trawl gear. VMS will provide accurate pot, longline and nongroundfish trawl (except pink shrimp on 4A) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, and CA nearshore species management, prawn, sea cucumber, and CA halibut management. This may be valuable for those monitoring fisheries that have area restrictions. Alternative 4B results in no change over Alternative 4A for pink shrimp vessels because fishing in the RCA is permitted for these vessels. Increased longline, pot and nongroundfish trawl position and effort data could be used along with declaration reports, observer data, survey information, and

fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs.

Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 590 vessels groundfish, 58 CA halibut, and 10 HMS vessels using line gear to take and retain, possess or land groundfish (excludes salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for the vessels identified under this alternative. VMS will provide accurate pot, longline, nongroundfish trawl (except pink shrimp), and line gear (except salmon troll) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, and CA nearshore species management, prawn, sea cucumber, HMS and CA halibut management Alternative 5B does not include vessels in fisheries that are projected to have minimal impacts on overfished species (10 HMS line and 2 longline, 21 Dungeness crab pot), it includes approximately 234 salmon troll vessels. Under this alternative, VMS would allow for greater flexibility in the use of management rules for pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll), and will thereby help to maintain the integrity of data used for groundfish management and possibly salmon management. VMS will provide accurate pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, prawn, and CA nearshore species, prawn, sea cucumber, and CA halibut management. Alternatives 5A and 5B may also benefit salmon management which has area restrictions.

Alternative 6A, which applies to any vessel engaged in commercial fishing to which an RCA restriction applies, includes the largest number of OA vessels. Approximately 1,583 vessels are included under Alternative 6A: 349 vessels using longline gear are included (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear identified under Alternative 3; all vessels using trawl gear (approximately 32 ridgeback prawn, 14 Sea cucumber, and 34 CA halibut vessels); 892 vessels using line gear as identified under Alt. 5B (includes salmon troll coastwide) that take and retain, possess or land OA groundfish; and 72 vessels using net gear (25 HMS and 47 CA halibut). VMS would allow for greater flexibility in the use of management rules for pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll), and will thereby help to maintain the integrity of data used for groundfish management and possibly salmon management. VMS will provide accurate pot, longline, nongroundfish trawl (except pink shrimp), and line gear fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut management, Dungeness crab, prawn, HMS, CA nearshore species, salmon, sea cucumber, and CA halibut management. Data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. Alternative 6A would provide the most VMS data and would support the most flexible management regime.

Alternative 6B affects approximately 58 less vessels annually than does Alternative 6A, all of whom use salmon troll gear north of 40°10' N. lat. and retain only yelloweye rockfish. Alternative 7, is much the same as Alternative 6A except that data from approximately 22 vessels (6 longline, 2 pot, and 14 line gear vessels) would not be available because the vessels less than 12 feet in length would be excluded. However, most if not all vessels under 12 feet in length are not expected to fish in Federal waters and would therefore not trigger the VMS requirement.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, and California sheephead pot. Data from 1,463 vessels includes data from: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using CA halibut net gear,

and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for vessels identified under this alternative. For the incidental OA vessels identified under this alternative, accurate VMS fishing location data may be beneficial to the nongroundfish target fisheries management. Data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs.

Because Alternative 9 excludes those vessels with minimal annual catch of groundfish, those that land less than 500 lb of groundfish in a calendar year, it includes fewer nongroundfish trawl vessels than Alternative 8. Under Alternative 9, data from 1,123 vessels could allow for greater flexibility in the use of management rules for the vessels under this alternative. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 California halibut 3and pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for vessels identified under this alternative. For the incidental OA vessels identified under this alternative, accurate VMS fishing location data may be beneficial to the nongroundfish target fisheries management. Only small amounts of data are likely to be available from the California halibut, and salmon troll fisheries.

Alternative 10, the no action alternative would have no VMS requirements, but the use of RCA management would be discontinued and management measures such as trip limits and closed seasons would be used to reduce the catch of overfished species. Little data would be available to managers to assess OA fishing location and intensity.

SOCIO-ECONOMIC ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
HARVESTERS & PROCESSORS	Changes in fishery participation costs and groundfish revenue as a result of the requirement to carry and use VMS.
Alternative 1 Status quo	Direct impacts No change in fishery participation costs for harvesters. Because enforcement has less ability to target enforcement activities, vessels without VMS or declaration reports may be the subject of more investigations and boardings than vessels with VMS or those providing declaration reports. The RCAs may need to be simplified, or buffers around closed areas added so the integrity of closed areas can be maintained; fishers will likely encounter increased costs from fishing in areas where catch rates are lower. Indirect impacts Potential future groundfish catch levels may be reduced and stability in the fishery may be decreased if non-compliance with depth-based management measures results in higher than projected of overfished species catch.
Alternative 2 Vessels using longline gear	Direct impacts: Per vessel costs for a transceiver unit with installation are $1,200-$2,700 in Year 1, and $250-$625 in subsequent years. Annual operating cost to harvesters include: maintenance $60-$160 and transmission fees $192-$730. Fishers who land groundfish taken incidentally in non-groundfish fisheries and fishers who are less dependent on groundfish may choose to exit the fishery by not retaining groundfish or by not targeting groundfish. An unknown portion of directed groundfish vessels using longline gear to take and retain, possess or land groundfish may choose to change gears to pot or line gear avoid VMS requirements. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $448,224 - $1,458,660 year 1, $61,824 - $235,060 in subsequent years. Greater flexibility in the use of management rules with geographical areas restrictions allows greater access to healthy stocks than would otherwise not be allowed. Indirect impacts: Potential for future increases in groundfish catch levels could offset short-term economic loss associated with VMS if increased stability in the fishery results because the integrity of RCAs is maintained. Benefits of fishery stability would likely be greatest for fishers with high degrees of dependency on groundfish. If less dependent vessels leave the fishery, groundfish landings limits for healthy stocks could potentially increase for the remaining fishers. Vessels that purchase VMS units with 2-way communications could choose to use email communications to market catch that would otherwise be discarded at sea. If this were to occur, it could lead to greater efficiencies in seafood marketing and reduced discards for approximately 282 directed groundfish, 38 Pacific halibut, and 2 CA halibut vessels using OA longline gear. If a large portion of the fishery chose to use 2-way communications to contact a broader range of buyers and coordinate deliveries or to negociate purchase prices, it could result in shift in the processing sector. Processors buying low volumes of groundfish from a large number of fishers who each land small amounts, such as occurs in the live-fish fisheries, may have difficulty obtaining groundfish if the number of fishers who choose to exit the fishery is substantial in a given port.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
HARVESTERS & PROCESSORS	Changes in fishery participation costs and groundfish revenue as a result of the requirement to carry and use VMS.
Alternative 3 Vessels using longline or pot gear	Direct impact: Per vessel costs are the same as Alt. 2. An unknown portion of directed groundfish vessels using pot gear may choose to change to line gear to avoid VMS requirements. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $716,880 - $2,332,950 year 1, $98,880 - $375,950 in subsequent years. Greater flexibility in the use of management rules with geographical areas - slightly greater benefit than Alt. 2 because both longline and pot vessels that take and retain, possess or land groundfish are included. Indirect impact: Potential for future increases in groundfish catch levels slightly increased over Alt. 2., because the likelihood of the integrity of the RCAs being maintained increases when both longline and pot vessels that take and retain, possess or land groundfish are included. Benefits of fishery stability would be greatest for directed fishers who have a high degree of dependency on groundfish. Potential benefits of marketing efficiencies and potential shift in processing sector as identified under Alt. 2, plus approximately 193 vessels using pot gear could choose to use VMS communications as marketing tool. The risk to low volume processors is slightly greater than Alt. 2
Alternative 4A Vessels using longline, pot or trawl gear (except pink shrimp)	Direct impact: Per vessel costs are the same as Alt.2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $824,064 - $2,681,760 year 1, $113,664 - $432,160 in subsequent years. Greater flexibility in the use of management rules with geographical areas - slightly greater benefit than Alt. 3 because longline, pot, and nongroundfish trawl (excluding pink shrimp) vessels that take and retain, possess or land groundfish are included. Indirect impact: Potential for future increases in groundfish catch levels slightly increased over Alt. 3., because likelihood of RCA integrity being maintained is increased when longline, pot, and nongroundfish trawl (excluding pink shrimp) vessels are included. Benefits of fishery stability would be greatest for directed fishers who have a high degree of dependency on groundfish. Potential benefits of marketing efficiencies and potential shift in processing sector is as identified under Alt. 2 and 3, plus approximately 77 vessels using nongroundfish trawl gear could choose to use VMS communications as marketing tool. The risk to low volume processors is slightly greater than Alt. 3

SOCIO-ECONOMIC ENVIRONMENT - Continued	
HARVESTERS & PROCESSORS	Changes in fishery participation costs and groundfish revenue as a result of the requirement to carry and use VMS.
Alternative 4B Vessels using longline, pot or trawl gear	Direct impact: Per vessel costs are the same as Alt.2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $899,232 - $2,926,380 year 1, $124,032 -$471,580 in subsequent years. Greater flexibility in the use of management rules with geographical areas - benefits are the same as Alt. 4A because longline, pot, and nongroundfish trawl vessels that take and retain, possess or land groundfish are included. Cost to pink shrimp fishers increases without increase in direct benefits. Indirect impact: Potential for future increases in groundfish catch levels same as Alt. 4A., because likelihood of RCA integrity being maintained is increased when longline, pot, and nongroundfish trawl vessels are included. Benefits of fishery stability would be greatest for directed fishers who have a high degree of dependency on groundfish. Pink shrimp trawl is neutral because they use finfish excluders and do not have RCA restrictions. Potential benefits of marketing efficiencies and potential shift in processing sector is as identified under Alt. 2 and 3, plus approximately 131 vessels using nongroundfish trawl gear could choose to use VMS communications as marketing tool. Risk to low volume processors is slightly greater than Alt. 4B
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll.	Direct impact: Per vessel costs are the same as Alt.2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $1,740,000 - $5,662,500 year 1, $240,000 - $912,500 in subsequent years. Greater flexibility in the use of management rules with geographical areas - slightly greater benefit than Alt. 4A because longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessel (excluding salmon troll) that take and retain, possess or land groundfish are included. Indirect impact: Potential for future increases in groundfish catch levels slightly increased over Alt. 4A, because likelihood of RCA integrity being maintained is increased when longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessel (excluding salmon troll) that take and retain, possess or land groundfish are included. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish. Potential benefits of marketing efficiencies and potential shift in processing sector as identified under Alt. 2, 3 and 4 except that approximately 590 groundfish, 58 CA halibut, and 10 HMS vessels using line gear to take and retain, possess or land groundfish could also receive potential benefits of marketing efficiencies and stability in the groundfish fishery. Risk to low volume processors is slightly greater than Alt. 4

Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline & line, and Dungeness crab pot gear.	Direct impact: Per vessel costs are the same as Alt.2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,022,576 - $6,582,090 year 1, $278,976 - $1,060,690 in subsequent years. Greater flexibility in the use of management rules with geographical areas - slightly greater than Alt. 5A because longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessels that take and retain, possess or land groundfish are included. HMS and Dungeness crab vessels are not projected to have overfished species catch in 2005; therefore, excluding them would likely result in minimal if any changes to overfished species management flexibility. Indirect impact: Potential for future increases in groundfish catch levels slightly increased over Alt. 5A., because likelihood of RCA integrity being maintained is increased when longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessels that take and retain, possess or land groundfish are included. Salmon troll vessels have a greater potential for taking constraining overfished species than do the Dungeness crab and HMS vessels that would be excluded under this alternative. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish. Potential benefits from marketing efficiencies and stability in the groundfish fishery as identified Alt. 2, 3, 4 and 5A, except Dungeness crab and HMS vessels, but for an additional 241 salmon troll vessels. Risk to low volume processors is slightly greater than Alt. 5A because salmon troll vessels are included
Alternative 6A Vessels with RCA restrictions	Direct impact: Per vessel costs are the same as Alt.2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,203,536 - $7,170,990 year 1, $303,936 - $1,155,590 in subsequent years. Greatest flexibility in the use of management rules with geographical areas because all longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessel that have RCA restrictions would be included. Unlike 5B, all nongroundfish trawl vessels would be included rather than only those that take and retain, possess or land groundfish. Indirect impact: Potential for future increases in groundfish catch levels is greatest under this alternative, because likelihood of RCA integrity being maintained is increased when all vessels that have RCA restrictions are included. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish. Potential benefits from marketing efficiencies and stability in the groundfish fishery as identified under Alt. 2, 3, 4, & 5A and all Pacific halibut directed fishery vessels, vessels using salmon troll gear to take and retain, possess or land groundfish, and all vessels using nongroundfish trawl gear. Risk to low volume processors is similar to 5B

SOCIO-ECONOMIC ENVIRONMENT - Continued	
HARVESTERS & PROCESSORS	Changes in fishery participation costs and groundfish revenue as a result of the requirement to carry and use VMS.
Alternative 6B Vessels with RCA restrictions except salmon troll north that retain only yellowtail rockfish	Direct impact: Per vessel costs are the same as Alt. 2. Vessels that are likely to leave the fishery is the same as Alt. 6A except that the number of salmon trollers that are likely to leave the fishery is slightly less than under Alt. 6A because 58 vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would not be required to have VMS. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,122,800 - $ 6,908,250 in year 1, $292,800 - $1,113,250 in subsequent years. Greater flexibility in the use of management rules with geographical areas (slightly less than 6A) because all longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessels (excluding salmon troll north of 40°10' N. lat. that only land yellowtail rockfish) that have RCA restrictions would be included. Unlike Alt.5B, all nongroundfish trawl vessels would be included rather than only those that take and retain, possess or land groundfish. Indirect impact: Potential for future increases in groundfish catch levels is slightly less than to those identified under Alt. 6A; 58 salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. Potential benefits from marketing efficiencies as identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. The risk to low volume processors greatest, but similar to 5B
Alternative 7 Vessel >12 ft with RCA restrictions	Direct impact: Per vessel costs are the same as Alt. 2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,172,912 - $7,071,330 year 1, $299,712 - $1,139,530 in subsequent years. Greater flexibility in the use of management rules with geographical areas because all longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessels >12 ft in length that have RCA restrictions would be included. Unlike Alt.5B, all nongroundfish trawl vessels would be included rather than only those that take and retain, possess or land groundfish. Basically, same as 6A because it is unlikely that many, if any, of the 22 vessels that are < 12 ft in length fish in Federal waters. Indirect impact: Potential for future increases in groundfish catch levels is similar to those identified under Alt.6A because 22 vessels under 12 ft in length would be excluded. Few if any of these vessels are likely to fish in Federal waters. Potential benefits from marketing efficiencies similar to those identified under Alt.6A because 22 vessels under 12 ft in length would be excluded. Few if any of these vessels are expected to fish in Federal waters. Risk to low volume processors is similar to 5B

SOCIO-ECONOMIC ENVIRONMENT - Continued	
HARVESTERS & PROCESSORS	Changes in fishery participation costs and groundfish revenue as a result of the requirement to carry and use VMS.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal.	Direct impacts No change in fishery participation costs for harvesters. Per vessel costs are the same as Alt. 2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is$2,036,496 -$6,627,390 year 1, $280,896 - $1,067,990 in subsequent years. Greater flexibility in the use of management rules with geographical areas for the 1,463 vessels included under this alternative: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). Indirect impact: Potential for future increases in groundfish catch levels similar to Alt 6A. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish. Potential benefits from marketing efficiencies and stability in the groundfish fishery similar to those identified under Alt.6A for directed groundfish vessels.
Alternative 9 Directed vessels. those that land more than 500 lb of groundfish in a calendar year.	Direct impacts No change in fishery participation costs for harvesters. Per vessel costs are the same as Alt. 2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $1,563,216 - $5,087,190 year 1, $215,616 - $819,790 in subsequent years. Greater flexibility in the use of management rules with geographical areas for the 1,123 vessels included under this alternative 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 California halibut 3and pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). Indirect impact: Potential for future increases in groundfish catch levels similar to Alt 6B. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish. Potential benefits from marketing efficiencies and stability in the groundfish fishery similar to those identified under Alt.6A for directed groundfish vessels.
Alternative 10 No Action. No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impacts No change in fishery participation costs for harvesters. If the use of RCAs are eliminated, closed season and reduced trip limits would like result in a drastic reductions in directed OA fishing opportunity. Indirect impacts Potential future groundfish catch levels may be reduced and stability in the fishery may be decreased if non-compliance with depth-based management measures results in higher than projected of overfished species catch.
Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.	

4.3.3 Harvesters and Processors

Direct Impacts**:** While the primary focus of VMS, from a resource management perspective, is with the collection of position data to monitor compliance with depth-based area management, there are very clear benefits to industry from VMS. The most evident direct benefit to industry resulting from the availability of VMS information is the flexibility in fishery management, such as the use of depth-based management.

To allow for a more liberal depth-based management regime, as has been in place since 2003, it was necessary for the Council and NMFS to take action to establish a monitoring program to ensure the integrity of these large irregularly-shaped depth-based conservation areas. With the 2003 Annual Specifications and Management Measures, the Council recommended along with depth-based management strategy, that NMFS include implementation of a VMS monitoring system to track movement of vessels through and within the RCAs. Without a depth-based management strategy, the fishery would be managed under the more seriously constrained limits on healthy stocks that co-occur with overfished species. Geographically defined areas would likely revert to those that were in place before September 2002. These areas tended to be nearshore or defined by a simple latitude lines.

A more liberal depth-based management regime is only possible if the integrity of the depth-based conservation areas can be ensured. Maintaining the integrity of the conservation areas largely depends upon the ability to enforce such management measures. Without the ability to ensure the integrity of the conservation areas, it is most likely that the depth-based management strategy will be discontinued. If this were the case, the management structure for those fisheries without VMS could well revert back to more restrictive limits or no limits on healthy stocks in order to protect overfished species.

When linked with a personal computer, lap top or data terminal, VMS systems with 2-way communications (currently 2-way systems are not required in groundfish fishery). Two-way systems can provide commercial fishers with the opportunity obtain information from processors or home offices and to report catch information electronically to home offices and fisheries managers. Under VMS, detailed commercial catch data and details of specific areas fished (provided by GPS) could be recorded using on-board computers or mobile terminals and transmitted directly to a central database. The central database could be programmed to analyze the aggregate data from all vessels as it is received, thereby enabling the performance of the fishery to be monitored in 'real time', allowing more effective and timely fisheries management strategies to be developed. This provides potential cost savings for fishermen, particularly if fishery management transforms from being reactive to being a proactive process involving decisions based on analysis of real time data about the fishery. Fisheries management strategies are underpinned by catch data supplied by commercial and recreational fishers. There is usually a substantial delay before this information is received, analyzed and available in a format suitable for use by fisheries managers and industry. Some mis-reporting and transcription errors can be addressed using VMS.

Cost burden: The cost burden of VMS includes the costs for installation, VMS transceiver unit, annual maintenance, replacement cost, cost to transmit hourly positions and declaration reports. Table 4.3.4.1 shows the estimated cost burden per vessel for VMS.

Table 4.3.3.1. Estimated burden, per vessel, for the VMS monitoring systems

	Alternative 1&10 Status quo	Alternatives 2-9 Cost per vessel for VMS and declaration reports
Installation - start up cost	$0	Minimal - not to exceed 4 hours or $200 Most are do-it yourself installation, manufacturer install approximately $200 do-it-yourself $120 5 min to complete installation report, $3 to send fax to NMFS
VMS transceiver/transponder unit - start up cost	$0	$1,000 - $2,500 ($3,800 if computer is added for 2-way communications including email)
Annual maintenance * Self * Professional	$0	2 hours or $60 per year 2 hours or $160 per year
Annual replacement costs (unit cost/years of service)	$0	$250-$625 per year (estimate based on 4 years of service)
Annual cost to transmit 24 hourly position reports	$0	$192-$730 ($15.99/mo-$2/day)
Annual cost to transmit exemption reports (4 min/rpt 2 per year)	$0	$0 (toll free call)
Annual cost to transmit declaration report (4 min/rpt- 12 time per year)	$0	$0 (toll free call)

Installation - The time burden for installation of the units is estimated at 4 hours per vessel, or $120. Personnel costs are estimated to be $30 per hour (Table 4.3.3.1.). The actual installation time for a VMS unit is estimated to be less than two hours, but a higher estimate of 4 hours/vessel is based on a worst case scenario where the power source (such as a 12 volt DC outlet) is not convenient to a location where the VMS unit can be installed. Most of the systems are do-it-yourself installations.

The installation of the Inmarsat-C Thrane units are do-it-yourself. The installation of software and attachment of a personal computer or lap top to an Inmarsat-C unit may also require dealer assistance. Satamatics and Orbcomm units can be self installed. However, vendor experience indicates that professional installations provide the best results for optimal unit performance.

Installation/Activation Report - Given that the VMS hardware and satellite communications services are provided by third parties as approved by NMFS, there is a need for NMFS to collect information on the individual vessel's installation in order to ensure that automated position reports will be received. This information collection would not increase the time burden for installation of VMS, but does require that a certification and checklist be returned to NMFS prior to using the VMS transceiver to meet regulatory requirements.

The checklist indicates the procedures to be followed by the installers. The VMS installer completes the NMFS issued checklist and signs the certification before returning it to NMFS. Signing the completed checklist shows that the installation was done according to the instructions and provides the Office of Law Enforcement with information about the hardware installed and the communication service provider that will be used by the vessel operator. Specific information that links a permitted vessel with a certain transmitting unit and communications service is necessary to ensure that automatic position reports will be received properly by NMFS. In the event that there are problems, NMFS will have ready access to a database that links owner information with installation information. NMFS can then apply troubleshooting techniques to contact the vessel operator and discern whether the problem is associated with the transmitting hardware or the service provider.

The time and cost burden of preparing and submitting installation information to NMFS is minor. Submission of a checklist would be required only for the initial installation or when the hardware or communications service provider changes. NMFS estimates a time burden of 5 minutes ($2.50 at $30 per hour) for completing the checklist and additional $3 for mailing/faxing to NMFS, for a total of $5.50 per occurrence (Table 4.3.3.1).

The ability for NMFS to ensure proper operation of the VMS unit prior to the vessel's departure will save time and money. The installation checklist and activation report are available over the internet website. These reports would be faxed or mailed to NMFS.

VMS transceiver unit On September 23, 1993, NMFS published proposed VMS standards at 58 FR 49285. On March 31, 1994, NMFS published final VMS standards at 59 FR 15180. These notices stated that NMFS endorses the use of VMS and defined specifications and criteria for VMS use. On September 8, 1998, NOAA published a request for information (RFI) in the Commerce Business Daily in which it stated the minimum VMS specifications necessary for NOAA's approval. The information was used as the basis for approving the mobile transceiver units and communications service providers for the Pacific coast groundfish fishery.

Units currently type approved for the Pacific Coast Groundfish Fishery are shown in (Table 4.3.3.2.) And include: Thrane and Thrane TT 3022D and 3026, Satamatics SAT101, and Stellar ST2500G. NMFS Type approved units are tested and approved by NMFS OLE. A list of VMS mobile transponder units and communications service providers approved by NOAA for the Pacific Coast groundfish fishery were published in the Federal Register on November 17, 2003 (68 FR 64860). Each time the list is revised, it will be published in the Federal Register. The cost of the transceivers currently type approved for the Pacific Coast groundfish fishery are shown in Table 4.3.3.2.

The North American Collection and Location by Satellite, Inc. (NACLS) is the sole service provider of the ArgoNet systems. The Argos Mar-GE and MAR-YX mobile transponder units costs $2,000. The ArgoNet MAR GE uses NOAA polar-orbiting satellites, and, as such, it is considered a NOAA Data Collection and Location System. The use of any NOAA Data Collection and Location System is governed by 15 CFR part 911. Under these regulations, the use of a NOAA Data Collection and Location System can be authorized only if it is determined that there are no commercial services available that are adequate. In addition, special provisions have been made because of cost effectiveness to the Government, resulting in a temporary approval (3 year approval was granted for the Atlantic pelagic longline fishery).

On June 10, 2002, 50 CFR 679.7(a)(18) required all vessels fishing in the Bering sea and Gulf of Alaska using pot, hook-and-line or trawl gear that are permitted to directly fish for Pacific cod, Atka mackerel or pollock to have an operable VMS transceiver. Vessels that also participate in the WOC fisheries (primarily LE vessels) qualified for reimbursements to the Argos MAR-GE as a result of their participation in the Alaska groundfish fishery. Allowing the use of Argos MAR-GE by WOC operating vessels that have purchased these units for participation in the Alaska groundfish fisheries would eliminate the cost of purchasing, installing and maintaining a second unit for these vessels. As of April 15, 2004(69 FR 19985,) new provisions for the Alaska fisheries prohibit the installation of new Argos units. Replacement units will need to be compatible with the requirements of both fisheries or vessels will need to purchase separate units. Similarly, allowing vessels to use units they have already purchased for other business purposes, providing they are a type-approved model with the required software and hardware, would also eliminate the cost of

purchasing, installing and maintaining a second unit for these vessels. The number of OA vessels that currently have VMS transceivers is unknown.

Most of the VMS transceiver units can be operated for extended periods from the same DC power source used to run other on board electronic equipment and so should increase power consumption only marginally.

Maintenance of transponder unit Once a vessel is used for fishing in the OA fishery in Federal waters, the vessel operator is required to operate the VMS unit continuously for the remainder of the year. This means that the vessel operator will need to maintain the transponder unit, antennas, and the electrical sources that power the system themselves or have it serviced by a professionally.

When an operator is aware that transmission of automatic position reports has been interrupted, or when notified by NMFS that automatic position reports are not being received, they must contact NMFS and follow the instructions provided. Such instructions may include, but are not limited to, manually communicating to a location designated by NMFS the vessel's position or returning to port until the VMS is operable. There is a reporting burden associated with this requirement, but it is not expected to be substantial. The annual burden of these communications and the time required to maintain the antennas and electrical systems on the vessel operator is estimated to be approximately 2 hours per year or $60 if done by the vessels personnel, or $160 if professionally serviced (Table 4.3.3.1). In addition, some systems may require software to be updated. Many of the transponders can have their set of features upgraded by being reloaded/flashed with updated versions.

If a unit needs to be repaired, there may be fishing opportunity lost unless the unit can be quickly replaced.

Replacement cost (purchase price/years of service) The various VMS transceivers have similar life spans of about 4- 5 years before the units need to be replaced. Because of advancements in VMS systems or service providers that may no longer provide services, some models may become obsolete in less than 5 years. The purchase of these units may be considered as a tax deductible business expense during the first year of use. For depreciation purposes, VMS devices using satellite technology may qualify as “five-year property”, although devices using cell phone technology probably will be treated similar to other cell phone equipment, as “seven-year property.” For the purposes of this analysis, 4 years was used to estimate unit replacement costs. Table 4.3.3.1. shows the range of replacement costs.

Cost to transmit hourly positions The primary costs after purchase and installation of a VMS is the charge for the messages that communicate the vessel's position. Once installed and activated, position reports are transmitted automatically to NMFS via satellite. Once a vessel is used for fishing in the OA fishery in Federal waters, the vessel operator is required to operate the VMS unit continuously for the remainder of the year. The total costs for these messages depend on the system chosen for operation and the number of fishing days for units with a sleep function. Many of the systems have a sleep function. Position transmissions are automatically reduced when the vessel is in port. This allows for port stays without significant power drain or power shutdown. When the unit restarts, normal position transmissions automatically resume before the vessel goes to sea.

The estimated time per response varies with type of equipment and requirement. Upon installation, vessel monitoring or transponder systems automatically transmit data, which takes about 5 seconds, except when issued a VMS exemption or when the vessel is inactive in port and the VMS goes into sleep mode. Transmission costs vary between units, with some having daily rates or monthly rates. The daily rate for the Inmarsat D+, Inmarsat C, and Orbcom units is $2, while providers have begun providing packages as low as $15.99/mo for fishers who spend much of the month tied to the dock, resulting in reduced position reports (Table 4.3.3.1).

Table 4.3.3.2. VMS Equipment Currently in Type-approved for use in the Pacific Coast Groundfish Fisheries

Communication Service	Orbcomm	Inmarsat D+	Argos a/	Inmarsat-C
Transceiver/transponder name	**SST2500G-NMFS**	**Satamatics SAT101**	**MAR GE**	**Thrane and Thrane TT3022D, TT3026D**
Number of boats using				
Geographic coverage, when in line of sight of satellite or cell	Global	Global	Global	Global to 78°N/S
Communication between ship – shore	Two-way	Two-way	One-way, (ship-to-shore)	Two-way
Satellite type	Low earth orbit, Orbcomm Network	Geo-stationary, INMARSAT	Polar-orbiting, 5 NOAA meteorological	Geo-Stationary, INMARSAT
Time between the vessel position fix and receipt at NMFS	Within 5-10 minutes	Within 5-10 minutes	Varies per latitude, Alaska – 10-30min. avg. wait. HMS – 60-90min. wait	Within 5-10 minutes
Ability to poll/query the transceiver	Yes	Yes	No	Yes
Interval between position reports	Configurabel	Configurabel	30 - 60 minutes depending upon latitudes	Configurable for 5 minutes to 24 hours
Ability to change the interval between position reports	Remote from OLE	Remote from OLE	Factory reprogramming	Remotely from OLE
Position calculation (accuracy)	Integrated GPS (20 m)	Integrated GPS (20 m)	Integrated GPS (20m), reverts to Doppler when GPS blocked (350 or 1000m)	Integrated GPS (20m)
Automatic anti-tampering and unit status messages	Yes	Yes	Yes	Yes
Distress signal	Yes	Yes	Yes	Yes
Reduces power when stationary	Yes	Yes	Yes	Yes
Installation	Do-it-yourself	Do-it-yourself	Do-it-yourself	Dealer or electrician (costs not included), or do-it-yourself
Internal battery back-up	Yes	Yes	Yes, 48-hour	No
Log or memory buffer storing positions / number of positions	Yes	Yes	Yes, must download manually/?	Yes, auto, remote or manual download/ Trimble – 5000 Thrane – 100
Can send logbook/catch report data	Yes	Yes, limited	Yes, with computer	Yes, with computer
Transceiver/transponder cost	$1,200	$1,200	$2000 ($400 keypad optional)	Thrane TT3022D $2,500, TT3026M $1,550; additional $1,300 if optional computer for email is included
Daily communications cost for hourly positions	$2	$2	$5	$2

a/ The Argos MAR GE is only allowed for vessels that have been required to have this model for other fisheries such as the Alaska groundfish fishery

Exemption reports Exemption Reports would be sent by the vessel owner or operator whenever their vessel qualified for being excused from the requirement to operate the mobile transceiver unit continuously 24 hours a day throughout the calendar year (e.g. when the vessel will be operating outside of the EEZ for more than 7 consecutive days or the vessel will be continuously out of the water for more than 7 consecutive days). A vessel may be exempted from the requirement to operate the mobile transceiver unit continuously 24 hours a day throughout the calendar year if a valid exemption report is received by NMFS OLE and the vessel is in compliance with all conditions and requirements of the exemption. An exemption report would be valid until a second report was sent canceling the exemption.

Improved technology would be used to reduce the reporting burden on NMFS and the fishery participants. Vessels will call in exemption reports to a toll free number. With this system, vessels can call quickly and easily submit their report 24 hours a day.

Aside from the cost in time to summarize and call in a report, there will be no additional cost burden for respondents. All respondents are assumed to have access to a telephone. The telephone call will be placed through a toll-free number, so the respondent will not pay for the call. Two exemption reports are estimated to be submitted per vessel annually. Each report would require approximately 4 minutes to submit, for an average cost of $4 per vessel per year (at $30 per hour).

Declaration reports
Declaration reports are used to assist enforcement in identifying vessels that are legally fishing in conservation areas. Each declaration report is valid until cancelled or revised by the vessel operator. After a declaration report has been sent, the vessel cannot engage in any activity with gear that is inconsistent with that which can be used in the conservation area unless another declaration report is sent to cancel or change the previous declaration. Declaration reports are sent to NMFS and vessel operators receive confirmation that could be used to verify that the reporting requirement was met. It is necessary for a vessel owner, operator or representative to submit these reports because only they can make statements about where they intend to fish.

Vessels will call in declaration reports by dialing a toll-free, so the respondent will not pay for the call. The system allows vessels to quickly and easily submit their report 24 hours a day. Aside from the cost in time to summarize and call in a report, there will be no additional cost burden for respondents. All respondents are assumed to have access to a telephone.

Table 4.3.3.3 Range of VMS of projected costs to the fleet, by fishery and gear

Open access gear group	Average annual no. of vessels landing groundfish, 2000-2003	Cost to the fleet for VMS			Exvessel revenue from **all catch** for the by fishery for 2004	Exvessel revenue from **groundfish** for the by fishery for 2004
		Year 1, range of cost for purchase and installation of VMS units, - Per vessel cost - $1,200 -$2,500 ($3,800 with PC)	Subsequent years, range of costs for maintenance and replacement of VMS units Per vessel cost $80 - $785	Range of annual Transmission cost Per vessel cost $192 - $730		
Longline - groundfish directed	282	$338,400 - $761,400 ($1,071,600)	$87,420 - $221,652	$54,144 - $205,860	$1,429,412	$1,411,191
Longline - Pacific Halibut directed	65	$78,000 -$175,500 ($247,000)	$20,150 - $51,090 9	$12,480 -$47,450	$403,834	$28,920
Longline - CA Halibut	2	$2,400 -$5,400 ($7,600)	$620 - $1,572	$384 -$1,460	$3,749	--
Pot - groundfish directed	145	$174,000 - $391,500 ($551,000)	$44,950 - $113,970	$27,840 - $105,850	$990,939	$987,646
Pot - Dungeness crab	21	$25,200 - $56,700 ($79,800)	$6,510 - $16,506	$4,032 -$15,330	$70,436,411	$652
Pot - prawn/shrimp	6	$7,200 - $16,200 ($22,800)	$1,860 - $4,716	$1,152 -$4,380	$2,235,976	--
Pot - sheephead	21	$25,200 - $56,700 ($79,800)	$6,510 - $16,506	$4,032 -$15,330	$275,382	$7,088
Trawl - CA Halibut g/	40	$48,000 -$108,000 ($152,000)	$12,400 - $31,440	$7,680 -$29,200	$497,880	$35,637
Trawl - Sea Cucumber	14	$16,800 - $37,800 ($53,200)	$4,340 - $11,004	$2,688 -$10,220	$146,433	--
Trawl - Ridgeback Prawn	23	$27,600 - $62,100 ($87,400)	$7,130 - $18,078	$4,416 -$16,790	$140,523	$564
Trawl - Pink Shrimp	54	$64,800 - $145,800 ($205,200)	$16,740 - $42,444	$10,368 -$39,420	$5,776,643	$74
Line gear - groundfish directed	590	$708,000 - $1,53,000 ($2,242,000)	$182,900 - $463,740	$113,280 - $430,700	$2,512,737	$2,503,500
Line gear - CA halibut directed	58	$69,600 - $156,600 ($220,400)	$17,980 - $45,588	$11,136 -$42,340	$636,210	$5,674
Line gear - HMS	10	$12,000 - $27,000 ($38,000)	$3,100 - $7,860	$1,920 -$7,300	$1,492,405	$236
Line gear - Salmon troll (coastwide)	234	$280,800 - $631,800 ($889,200)	$72,540 - $183,924	$44,928 - $170,820	$25,824,244	$19,816
Line gear - Salmon troll (north only- no yellowtail)	176	$211,200 - $475,200 ($668,800)	$54,560 - $138,336	$33,792 - $128,480	$4,360,094	$13,046
Net gear - HMS	25	$30,000 - $67,500 ($95,000)	$7,750 - $19,650	$4,800 -$18,250	$1,383,716	$2,577
Net gear - CA halibut	47	$56,400 - $126,900 ($178,600)	$14,570 - $36,942	$9,024 - $34,310	XXX	$7,450

Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.

Description of analysis regarding vessels not retaining groundfish if VMS is required A simple analysis of economic costs and benefits was conducted to determine a plausible number of vessels that would retain groundfish if doing so meant that those vessels would be required to carry a VMS. Vessel level revenues were compared against the cost of purchasing, installing, maintaining, and operating a VMS system over a 20 year period. The cost of purchasing a unit was amortized over 20 years using an interest rate of 6 percent. Assumed in this analysis is that the decision to fish or not to fish was independent of groundfish retention for those fisheries where groundfish is not the target. This assumes that groundfish gross revenues are merely viewed as a bonus by fishers not targeting groundfish. Based on this assumption, total groundfish gross revenues were compared to annual VMS costs to determine whether vessels would elect to carry a VMS system. For vessels directing their efforts at groundfish, the analysis differed in that a range of vessels remaining in the fishery is presented based on a likely range of profit margins that correspond to gross revenues. This is done because groundfish is the target for those vessels, and the decision to fish is most likely based on the net revenue generated by the target if incidental catch is not part of expected future revenues. The lower bound of this range is 7.5 percent of gross revenues and the upper bound is 30 percent of gross revenues. Based on conversations with fishers and experience with the fishing industry, this range is expected to encompass the actual profit margin of the fishery, though additional input is necessary to further refine this range. Table 4.3.3.5 presents this simple analysis of economic costs and benefits.

Table 4.3.3.5 Approximate Number of Vessels Landing Groundfish if a VMS System is Required

Fishery	2000	2001	2002	2003	2004	Average
HMS - Hook and Line	0	0	0	0	0	0
CPS - Net	0	0	0	0	0	0
Salmon - Troll	1	4	3	0	2	2
California Sheephead - Pot	5	9	7	2	8	6
Pacific Halibut - Longline	9	5	6	14	20	11
California Halibut - Trawl	10	10	9	1	6	7
California Halibut - Hook and Line and Longline	1	3	0	3	4	2
Pink Shrimp - Trawl	45	38	28	1	1	23
Ridgeback Prawn - Trawl	6	5	3	2	1	3
Shrimp - Pot	2	4	4	2	1	3
Dungeness Crab - Pot	0	0	1	1	1	1
Groundfish Directed - Pot	52 - 83	49 - 82	50 - 80	56 - 96	48 - 70	51 - 82
Groundfish Directed - Longline	78 - 165	71 - 158	64 - 146	80 - 177	60 - 126	71 - 154
Groundfish Directed - Hook and Line (non-longline)	85 - 272	107 - 254	97 - 252	77 - 223	106 - 239	94 - 248

The OA groundfish fishery consists of vessels that do not necessarily depend on revenue from the fishery as a major source of income and predominately fish for other species where they inadvertently catch and land groundfish. Fishers who land groundfish taken incidentally in non-groundfish fisheries operating in areas outside the RCAs, and fishers who are less dependent on groundfish may choose to exit the fishery by not retaining groundfish or by not targeting groundfish.

Table 4.3.3.6. shows the number of OA vessels by gross income levels of dependency for all West Coast landings. Between November 2000 and October 2001, 1,287 vessels landed groundfish in the OA sector of the groundfish fishery. Of these, 58% of the vessels (200) with a greater than 95% dependency on groundfish had less than $5,000 of gross income from West Coast landings. These vessels would be the vessels most affected by VMS requirements. A greater proportion of vessels with lower levels of dependency on groundfish fell within income categories greater than $5,000. However, this table does not represent landings for years when the RCA requirements or state nearshore LE programs were in place. Increases in higher valued groundfish catch in 2003, primarily sablefish, which may reduce the proportion of OA vessels in the lowest (<$5,000) income category, are not included in this table. Table 4.3.3.7 shows the annual fishing revenue for vessels landing groundfish in various OA target fisheries and with the different gears.

Table 3.3.3.6 Number of open access vessels by gross income levels of dependency for all West Coast landings (based on data from November 2000 - October 2001) a/

	Exvessel revenue from West Coast landings				
	<5,000	$5,000-$50,000	$50,000-$200,000	>$200,000	Total
<5%	45	268	169	34	516
>5% &<35%	52	101	44	0	197
>35% &<65%	47	50	8	0	105
>65% &<95%	63	55	6	0	124
>95% &<100%	200	138	7	0	345
Total	407	612	234	34	1,287

Extracted from table 6-17a DEIS, Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish fishery
a/ open access vessels with more than half of their total landings value coming from groundfish are considered to be in the directed fishery

Table 4.3.3.6. Number of incidental open access vessels groundfish by exvessel group, 2000 - 2003 (based on 8/24/04 PacFin data)

Open access gear group	Number of open access vessels by groundfish exvessel revenue group				
	$0-$500	$501-$1000	$1001-$1500	$1501-$2000	>$2000
Longline -Groundfish Directed					
2000	76	27	25	11	164
2001	94	32	27	13	158
2002	59	30	17	12	145
2003	40	34	27	21	174
2004	40	27	19	13	123
Longline - Pacific Halibut					
2000	28	9	2	--	--
2001	28	3	2	1	1
2002	36	5	1	--	11
2003	23	6	2	2	5
2004	11	9	8	2	4
Longline - CA Halibut					
2000	5	--	–	--	–
2001	1	--	–	--	–
2002	2	--	–	--	–
2003	2	--	–	--	–
2004	2	–	–	–	–
Pot - Groundfish Directed					
2000	62	15	6	7	64
2001	48	14	16	1	61
2002	43	16	10	8	58
2003	31	12	14	7	70
2004	24	6	5	9	54
Pot - Dungeness crab					
2000	32	1	--	--	--
2001	24	1	--	--	--
2002	22	1	--	--	--
2003	16	1	--	--	--
2004	5	1	--	--	–

Open access gear group	Number of open access vessels by groundfish exvessel revenue group				
	$0-$500	$501-$1000	$1001-$1500	$1501-$2000	>$2000
Pot - prawn/shrimp					
2000	7	--	2	–	–
2001	2	2	1	1	1
2002	-	3	--	1	--
2003	4	--	1	1	--
2004	2	–	–	–	1
Pot - sheephead					
2000	16	3	--	--	2
2001	17	2	2	1	4
2002	21	5	--	1	1
2003	12	--	--	--	2
2004	8	4	3	--	1
Trawl - sea cucumber					
2000	--	--	--	--	--
2001	2	--	--	--	--
2002	2	--	--	--	--
2003	1	--	--	--	--
2004	1	--	--	--	--
Trawl - CA halibut					
2000	11	6	1	2	2
2001	22	5	3	1	2
2002	19	5	--	4	1
2003	16	--	--	--	1
2004	6	1	1	1	4
Trawl -Ridgeback Prawn					
2000	14	3	1	3	1
2001	10	2	3	--	1
2002	9	--	2	1	--
2003	10	--	2	--	--
2004	4	--	--	1	--
Trawl -Pink Shrimp					
2000	15	6	2	1	38
2001	11	8	1	6	25
2002	15	9	4	7	9
2003	5	1	--	--	--
2004	3	--	1	--	--
Line gear -Groundfish Directed					
2000	316	50	94	35	265
2001	236	52	66	31	250
2002	187	46	69	27	247
2003	154	36	68	26	217
2004	144	31	49	14	238
Line gear - CA halibut					
2000	68	1	--	--	--
2001	66	3	--	--	--
2002	58	--	--	--	--
2003	43	3	--	--	1
2004	40	4	--	1	--
Line gear - HMS					
2000	18	--	--	--	--
2001	12	--	--	--	--
2002	7	--	--	--	--
2003	3	2	--	--	--
2004	5	1	1	--	--
Line gear - Salmon troll (coastwide)					
2000	276	4	1	--	--
2001	238	5	--	--	--
2002	201	6	--	--	--
2003	197	2	1	1	1
2004	233	4	--	--	--

Open access gear group	Number of open access vessels by groundfish exvessel revenue group				
	$0-$500	$501-$1000	$1001-$1500	$1501-$2000	>$2000
Line gear - Salmon troll (north only)					
2000	209	3	--	--	--
2001	228	--	--	--	--
2002	143	5	--	--	--
2003	133	1	--	--	--
2004	155	2	--	--	--
Net gear - HMS					
2000	33	--	--	--	–
2001	26	1	--	--	–
2002	25	1	--	--	--
2003	20	--	–	–	–
2004	17	1	–	–	–
Net gear - CA Halibut					
2000	45	13	--	--	--
2001	38	9	--	--	--
2002	32	3	--	--	--
2003	33	4	--	–	–
2004	32	2	--	–	–

Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.

Indirect impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts on harvesters and processors include, long-term changes in fishing opportunity, catch availability, and catch value that could result from the VMS requirement and collection of position data.

Short-term economic losses should be offset by future increases in catch levels if increased stability in the fishery results because the integrity of RCAs is maintained. The ability to know the precise location of vessels provides for speedy identification of suspicious or illegal fishing activity in relation to closed areas. Rather than spending significant resources on routine surveillance, enforcement resources can be directed to vessels operating in an unusual manner in the RCAs. Improved enforcement is in the interest of all fishers. Fishers and processors will be the ultimate beneficiaries when the fisheries regulations, developed for conservation and management are properly implemented and enforced. Maintaining the integrity of closed areas that are designed to protect overfished stocks, will aid in the recovery of the stocks and help to guaranteed the future of the industry.

With VMS, the law-abiding skipper can be satisfied that there will be less likelihood of the enforcement officers inspecting vessels that comply with the closed area regulations and a greater probability that inspection will focus on vessels that are suspected of violating the regulations. At times, the commercial fishing industry is subjected to criticism from members of the public and from other stakeholder groups regarding its responsibility to the environment in terms of complying with closure regulations intended to protect vulnerable species. While there may be some irresponsible operators, it is generally believed that the majority of commercial operators abide by closed area restrictions. VMS offers the commercial industry a mechanism to demonstrate its compliance with such regulations and hence honor its responsibility to the long-term sustainability of fisheries resources.

Electronic marketing is growing in importance in many industries, and could be developed for the fishing industry. If a sufficient number of vessels participating in the West Coast fisheries have 2-way communications through VMS and a computer, opportunities to market seafood through e-commerce services (electronic marketing systems) could become more readily available to the West Coast fishing industry. The ability to access the internet via Inmarsat makes likely that electronic marketing of seafood will become established as individual companies set up their own systems.

Electronic marketing systems could become a component used to match the supply of fish from a number of scattered producers with the demand from a variety of markets. An advantage of an electronic marketing systems is that the trading function is separate from the physical transfer of catch between sellers and buyers, which could allow prices to be formed centrally without the costly process of assembling buyers and sellers at a single location. As fishermen are made more aware of electronic market potential, they may choose to alter fishing practices to avoid gluts, avoid catching lower value species, or retain incidentally caught species because they find a buyer while still at sea. The overall result could be a more competitive market and improvement in the use of mixed catches, including the sale of fish that would otherwise have been discarded at sea. While electronic marketing of seafood has been technically possible for some years, extensive and high quality ship-to-shore communications were required to enable fishermen to communicate catch information to a shore-based computer linked into the system. Recent advancements in satellite technology, such as those made by Inmarsat makes it possible to bypass this impediment, allowing electronic marketing in the fishing industry much more feasible for small businesses, such as those found in the West Coast.

Comparison of the Alternatives

The level of fleet coverage, that portion of the overall OA fishing fleet that would be required to have VMS and provide declaration reports, is the primary difference between the alternatives. Each of the alternatives defines the portion of the OA fleet, that would be required to carry and use VMS transceivers and provide gear declaration reports. Alternative 10 is the only alternative that goes beyond VMS coverage by discontinuing the non-trawl and trawl RCA requirements for the OA fisheries.

Alternative 1, is the least expensive alternative in the short-term since it only requires nongroundfish trawl vessels to provide declaration reports prior to leaving port on a trip in which fishing occurs in an RCA. The greatest difficulty in maintaining the integrity of closed areas to ensure recovery of the overfished stocks occurs under status quo. In the long- term, if unmonitored incursions into the RCA affect the recovery of overfished stocks, fishing opportunity may be further reduced.

Alternatives 2-9 contain VMS requirements, for different groups of vessels within the OA fleet**.** The per vessel costs for a transceiver unit with installation is the same under all of the alternative: $1,200-$2,700 in Year 1, and $250-$625 in subsequent years. Annual operating cost to harvesters include: maintenance, $60-$160, and transmission fees, $192-$730. The added cost of VMS is likely to result in some fishers not retaining groundfish so as to avoid the VMS requirements. Table 3.3.3.9 shows the number of vessels by gear group that landed less than 500 lb of groundfish per year between 2000 and 2004. Some fishers may speculate that others will leave the fishery and trip limits will increase, others will pay for VMS and continue to retain groundfish. Fishers who land groundfish taken incidentally in non-groundfish fisheries and fishers who are less dependent on groundfish may choose to exit the fishery by not retaining groundfish or by not targeting groundfish during short periods between other fishing activities**.** Table 4.3.3.5 shows the number of vessels by assumed profit margins for OA incidental fisheries vessels by gears, 2000-2004**.**

Alternative 2 maintains the provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 282 directed groundfish, 38 Pacific halibut, and 2 California halibut vessels using longline gear that take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the OA fleet (only 320 vessels using longline gear) to have and use VMS. The total cost of Alternative 2 to industry ranges between $448,224 - $1,458,660 year 1, $61,824 - $235,060 in subsequent years. An unknown portion of directed groundfish vessels using longline gear to take and retain, possess or land groundfish may choose to change gears to pot or line gear avoid VMS requirements.

Alternative 3 includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 193 vessels using pot gear. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $716,880 - $2,332,950 year 1, $98,880 - $375,950 in subsequent years. An unknown portion of directed groundfish vessels using pot gear may choose to change to line gear to avoid VMS requirements.

Alternative 4A includes the same vessels as Alternative 3, but adds the VMS and declaration reporting requirement for approximately 23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels using nongroundfish trawl gear (excludes pink shrimp vessels) for a total of 592 vessels. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery $824,064 - $2,681,760 year 1, $113,664 - $432,160 subsequent years. Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4A plus 54 pink shrimp vessels for a total of 646 vessels. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $899,232 - $2,926,380 year 1, $124,032 -$471,580 in subsequent years.

Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 590 directed groundfish, 58 California halibut, and 10 HMS vessels using line gear to take and retain, possess or land groundfish(excludes salmon troll vessels). The total number of vessels under 5A is 1,250. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $1,740,000 - $5,662,500 year 1, $240,000 - $912,500 in subsequent years. Alternative 5B, includes slightly more vessels than 5A because the number of salmon troll vessels that would be added under this alternative is greater than the number of HMS and Dungeness crab vessels that would not be included. Though alternative 5B does not include vessels in fisheries that are projected to have minimal impacts on overfished species (10

HMS line and 2 longline, 21 Dungeness crab pot), it includes approximately 234 salmon troll vessels. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,022,576 - $6,582,090 year 1, $278,976 - $1,060,690 in subsequent years.

Alternative 6A, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of OA vessels, 1,583 vessels. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,203,536 - $7,170,990 year 1, $303,936 - $1,155,590 in subsequent years. Unlike 5B, 6A also includes all the salmon troll vessels that take and retain, posses or land groundfish. Therefore, Alternative 6A would provide coverage for the largest number of vessels, which supports the greatest flexibility in the use of management rules with geographical areas.

Alternative 6B, affects approximately 58 fewer vessels annually than does Alternative 6A, all of which use salmon troll gear. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,122,800 - $6,908,250 in year 1, $2,92,800 - $1,113,250 in subsequent years. Under 6B, the vessels that are likely to leave the fishery is the similar to Alt. 6A, except that the number of salmon trollers that are likely to leave the fishery is slightly less under Alternative 6B because vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would not be required to have VMS. Alternative 7, is essentially the same as Alternative 6A because it applies to the same vessels except that vessels less than 12 feet in length would be excluded. It is likely that most, if not, all vessels under 12 feet in length will not fish in Federal waters and would therefore not trigger the VMS requirement. Under Alternative 7, the estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,172,912 - $7,071,330 year 1, $299,712 - $1,139,530 in subsequent years.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, and California sheephead pot. Data from 1,463 vessels includes data from: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,036,496 - $6,627,390 year 1, $280,896 - $1,067,990 in subsequent years.

Under Alternative 9 data from 1,123 vessels could be used to maintain the integrity of RCAs from longline, pot, trawl, line, net and other fishing gear impacts. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 California halibut and 3 pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $1,563,216 - $5,087,190 year 1, $215,616 - $819,790 in subsequent years.

There is no cost of VMS to the industry under Alternative 10. However, if the RCA requirements are discontinued under Alternative 10 the cost to the directed OA fisheries will likely be quite high as a result of drastically reduced seasons and trip limits. It is also likely that LE fishers would also see season and trip limit reductions to compensate for the higher expected bycatch by the OA directed fisheries.

SOCIO-ECONOMIC ENVIRONMENT	
SAFETY	Changes in search and rescue capability resulting from the requirement to carry and use VMS
Alternative 1 Status quo	Direct impact EPIRBS are the primary devise used to identify a vessel's location in an emergency situation. VHF radios are also used.
Alternative 2 Vessels using longline gear	Direct impact May provide position information that can be used to aid in search and rescue efficiency for 320 OA longline vessels. If VMS transceiver unit has distress signal, it may further reduce response time in an emergency. Indirect impacts If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. If fishing opportunity improves and profits to the individual vessel increase there may be fewer of these marginal vessels that tend to display more risk prone behavior including, the tendency to not adequately maintain equipment and vessels.
Alternative 3 Vessels using longline or pot gear	Direct impact & Indirect Impacts Same as Alt.2, but adds 145 directed, 21 Dungeness crab, 6 prawn, and 37 CA halibut vessels using pot gear
Alternative 4A Vessels using longline, pot or trawl gear, except pink shrimp trawl	Direct impact & Indirect Impacts Same as Alt. 2 and 3, but adds approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear (excludes pink shrimp vessels).
Alternative 4B Vessels using longline, pot or trawl gear	Direct impact & Indirect Impacts Same as Alt. 2 and 3, but adds approximately 131 vessels (54, pink shrimp, 23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear.
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll	Direct impact & Indirect Impacts Same as Alt. 2, 3 and 4A, plus 658vessels (590 vessels groundfish, 58 CA halibut, and 10 HMS vessels) using line gear to take and retain, possess or land groundfish(excludes salmon troll vessels).
Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline & line, and Dungeness crab pot gear.	Direct impact & Indirect Impacts Same as Alt. 2, 3, 4A and 5A, except 10 HMS line and 2 longline, 21 Dungeness crab pot are not included, but an additional 234 salmon troll vessels are included. 1,307 vessels total.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
SAFETY	Changes in search and rescue capability resulting from the requirement to carry and use VMS
Alternative 1 Status quo	Direct impact EPIRBS are the primary devise used to identify a vessel's location in an emergency situation. VHF radios are also used.
Alternative 6A Vessels with RCA restrictions	Direct impact May provide position information that can be used to aid in search and rescue efficiency for approximately 1,583 vessels: 349 vessels using longline gear as identified under Alt. 2 plus it includes all 65 Pacific halibut vessels; 193 vessels using pot gear identified under Alt. 3; 77 vessels using trawl gear (approximately 23 ridgeback prawn, 14 Sea cucumber, and 40 CA halibut vessels); 892 vessels using line gear 590 groundfish directed, 58 CA halibut, 234 salmon troll and 10 HMS vessels); and 72 vessels using net gear (25 HMS and 47 CA halibut). If VMS transceiver unit has distress signal, it may further reduce response time in an emergency. Indirect impacts If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. If fishing opportunity improves and profits to the individual vessel increase there may be fewer of these marginal vessels that tend to display more risk prone behavior including, the tendency to not adequately maintain equipment and vessels.
Alternative 6B Vessels with RCA restrictions except salmon troll north that retain only yellowtail rockfish	Direct impact & Indirect Impacts Same as Alt. 6A, but affects approximately <58 fewer vessels annually than does 6A because salmon troll vessel fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded.
Alternative 7 Vessel >12 ft with RCA restrictions	Direct impact & Indirect Impacts Same as Alt. 6A, but benefits are slightly reduced from those identified under Alt. 6A because approximately 22 vessels/yr (6 longline, 2 pot, and 14 line gear) each less than 12 feet in length, would not be carrying VMS transceivers.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal.	Direct impact May provide position information that can be used to aid in search and rescue efficiency for approximately 1,463 vessels: 349 vessels using longline gear 282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 CA halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 CA halibut, and 234 salmon troll vessels). If VMS transceiver unit has distress signal, it may further reduce response time in an emergency. Indirect impacts If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. If fishing opportunity improves and profits to the individual vessel increase there may be fewer of these marginal vessels that tend to display more risk prone behavior including, the tendency to not adequately maintain equipment and vessels.
SOCIO-ECONOMIC ENVIRONMENT - Continued	

SAFETY	Changes in search and rescue capability resulting from the requirement to carry and use VMS
Alternative 1 Status quo	Direct impact EPIRBS are the primary devise used to identify a vessel's location in an emergency situation. VHF radios are also used.
Alternative 9 Directed vessels. those that land more than 500 lb of groundfish in a calendar year.	Direct impact May provide position information that can be used to aid in search and rescue efficiency for approximately 1,123 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 CA halibut and 3 pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). If VMS transceiver unit has distress signal, it may further reduce response time in an emergency. Indirect impacts If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. If fishing opportunity improves and profits to the individual vessel increase there may be fewer of these marginal vessels that tend to display more risk prone behavior including, the tendency to not adequately maintain equipment and vessels.
Alternative 10 No Action. No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impact & Indirect Impacts EPIRBS are the primary devise used to identify a vessel's location in an emergency situation. VHF radios are also used.

4.3.4 Safety of Human life

Direct Impacts on the safety of human life at sea primarily consists of changes in search and rescue capability.

Response time to any incident at sea requires clear communications about the problem and the needs of the vessel's crew, an ability to quickly identify the location of the vessel, and the capability to either provide adequate information or to reach the vessel for an at seas rescue. An EPIRB is an emergency notification devise that is automatically released when a vessel sinks. After the EPIRB is released, it floats to the surface and automatically begins sending out an emergency distress signal that identifies the vessel location. Unfortunately, these devices do not always work as intended and a certain proportion of the units fail to work at all.

Though VMS transceivers are not replacements for EPIRBS, they can aid the USCG in search and rescue efforts when other sources of emergency information are not available. If an EPIRB or other safety system fails to transmit a vessel's last location, or if the vessel's last location is in question, VMS could be used to identify the vessel's last known position. Similarly, if a vessel's position reports fail to be received over a period of time, it may be used to alert processing center staff to a potential problem that can be forwarded to the USCG for further investigation. Though VMS shows where a vessel is located it becomes ineffective should the power be lost or a vessel sinks. Unlike EPIRBS which have their own power source, VMS is dependent on the vessel for power. Most VMS systems have distress buttons and some allow for two-way communications. Having the 2-way communication can aid in obtaining information about vessel safety and medical issues.

Indirect impacts on safety as a result of VMS would result if VMS altered risk prone behavior. When fishing opportunity is reduced and profits are marginal, vessels may display more risk prone behavior and may not adequately maintain equipment and vessels. If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. Though farther removed in time, increases in groundfish revenue from increased trip limits could result in vessels being better maintained. Similarly, if the integrity of the RCA can be maintained, the potential for recovery of overfished stocks is more likely and future harvest rates are more likely to increase

There is a certain degree of danger associated with groundfish fishing, however, little is known about the connection between fisheries management measures and incident, injury, or fatality rates in the fishery. Moreover, little is known about risk aversion among fishers or the values placed on increases or decreases in different risks.

There are safety concerns when small vessels are encouraged to fish in deeper waters and farther from assistance. Extended transits will result in longer exposure to harsh weather conditions, especially during winter months. This problem is compounded by the relatively small size and slow speed of many OA fishing vessels which will make it difficult for them to run from weather or return to port before sea conditions become hazardous. Small vessels are not able to withstand rough seas as well as larger vessels. The VMS provisions currently in regulation set a standard that prohibits groundfish directed vessels from drifting in the RCAs. This provision would apply to the OA fisheries as well.

Comparison of the Alternatives

Safety is expected to vary with the alternatives because of the difference in vessel coverage and the VMS information that may be available in an emergency situation. Table 4.3.1.1. Shows the percent of OA vessels less than 40 feet (ft) in length by dependency on the fishery for November 2000 through October 2001. During this time period, 90% or more of the most groundfish dependent vessels in the nearshore and shelf rockfish fleets were under 40 feet in length. With the creation of the RCAs it is assumed that many of the smaller vessels shifted their efforts off the shelf and in to nearshore areas. However 85% of the slope rockfish vessels and 72%of the sablefish vessels were also under 40 feet in length. When looking at the incidental OA fisheries for this time period, those with more than 50% of the fleet under 40 ft in length were

salmon (72%), Pacific halibut (65%), and Dungeness crab (56%). A large proportion of the less dependent groundfish vessels were also in fleets were more than 50% of the vessels were under 40 feet in length: nearshore (78%) and shelf rockfish (60%). Those alternatives that include the directed longline and pot vessels that are most likely to target slope species may benefit the smaller directed groundfish vessels that travel far from shore. Small vessels may be difficult to locate on the open ocean. If necessary, VMS position data could serve as a secondary source of information for locating these vessels in emergency situations.

No information regarding a vessel's fishing location is provided under Alternative 1, status quo. Alternative 2 maintains the provisions of status quo, but adds the VMS requirements for approximately 282 directed groundfish, 38 Pacific halibut, and 2 California halibut vessels using longline gear. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the OA fleet (only 320 vessels using longline gear) to have and use VMS and would therefore provide the least safety benefit of the VMS alternatives.

Alternative 3, includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 California sheephead vessels) using pot gear. Therefore, Alternative 3 would more vessels would have VMS units that Alternative 2, however there would less vessels than under Alternative 4A and therefore less of a safety benefit than Alternative 4A.

Alternatives 4A and 4B add VMS coverage for nongroundfish trawl vessels to the vessels identified under Alternative 3. The primary difference between the 2 alternatives is that Alternative 4A adds the VMS and declaration reporting requirement for approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels) using nongroundfish trawl gear that take and retain, possess or land groundfish. While Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4B plus 54 pink shrimp vessels. Many vessels that fish for pink shrimp are also registered to LE groundfish permits and therefore already have VMS requirements.

Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 590 vessels groundfish, 58 California halibut, and 10 HMS vessels using line gear to take and retain, possess or land groundfish (excludes salmon troll vessels). Alternative 5B includes slightly more vessels than 5A because the number of salmon troll vessels that would be added under this alternative is greater than the number of HMS and Dungeness crab vessels that would not be included. Though alternative 5B does not include vessels in fisheries that are projected to have minimal impacts on overfished species (10 HMS line and 2 longline, 21 Dungeness crab pot), it includes approximately 241 salmon troll vessels.

Alternative 6, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of OA vessels. Therefore, Alternative 6A would have the greatest safety benefits because the greatest number of vessels will be required to carry VMS transceivers. Alternative 6B, affects approximately 79 fewer vessels annually than does Alternative 6A, all of which use salmon troll gear. Alternative 7, is almost the same as Alternative 6A because it applies to the same vessels except that vessels less than 12 feet in length would be excluded. Most, if not, all vessels under 12 feet in length are not expected to fish in Federal waters and would therefore not trigger the VMS requirement.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, and California sheephead pot. Data available under this alternative includes 1,463 vessels includes data from: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). Position reports from the seas cucumber, ridgeback prawn, and pink shrimp trawl vessels would not be included under Alternative 8.

Because alternative 9 excludes those vessels with minimal annual catch of groundfish, those that land more than 500 lb of groundfish in a calendar year, it includes fewer nongroundfish trawl vessels than Alterative 8. Under alternative 9 data from 1,123 vessels could be used to maintain the integrity of RCAs from longline, pot, trawl, line, net and other fishing gear impacts. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 California halibut 3 and pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). No OA vessels would be required to have VMS under Alternative 10.

4.3.5 Communities

Fishing communities, as defined in the MSA, include not only the people who catch the fish, but also those who share a common dependency on directly related fisheries-dependent services and industries. Commercial fishing communities may include boatyards, fish handlers, processors, and ice suppliers. People employed in fishery management and enforcement make up another component of fishing communities. Community patterns of fishery participation vary coastwide and seasonally, based on species availability, the regulatory environment, and oceanographic and weather conditions. Communities are characterized by the mix of fishery operations, fishing areas, habitat types, seasonal patterns, and target species. Although unique, communities share many similarities. For example, all face danger, safety issues, dwindling resources, and a multitude of state and federal regulations.

Since 2003, the Council has used a depth-based management strategy to would allow fishing to continue in areas and with gear that can harvest healthy stocks with little incidental catch of low abundance species (overfished species). Stock assessments for four overfished species, bocaccio, yelloweye, canary and darkblotched rockfish indicated that little surplus production is available for harvest. Therefore, measures must be taken to protect these stocks and rebuild them to sustainable biomass levels.

Regulations that lower fishing quotas have historically reduced the income generated by the fishing fleet. When fishing income is reduced, the coastal communities typically suffer in the short- term. Constraints on the groundfish fishery resulting from the need to rebuild overfished species could cause and economic instability of fishery participants and associated fishing communities. However, recovery of fish stocks will help coastal communities and the industry, in the long term. In the long-term, Alternatives 2-7 provide a means to ensure the integrity of the depth-based management areas and thereby mitigate undesirable or greater economic impacts associated with overfished species management. If the RCAs cannot be maintained, it is likely that management measures will need to revert back to simple closed areas and very restrictive limits, which have a greater effect on fishing communities in the short-term.

In the short-term, if the added cost results in large numbers of incidental OA groundfish vessels and vessel that have a low level of dependency on groundfish leaving the fishery, the necessary fishing supplies that would otherwise be purchased by them may result in less sales for supporting businesses. However, since these are primarily incidental OA groundfish vessels, it would be assumed that the gear and supplies they normally purchase for the target fishery would remain unchanged.

There is a risk to low volume processors (addressed in the previous section) if a substantial number of incidental OA groundfish and less dependent fishers exit the fishery to avoid the added cost of VMS. This may particularly be a problem under Alternatives 5A-7, in which most incidental fisheries are included. If fewer incidentally caught groundfish are available, prices to processors and buyers may increase, these increases would then be passed on to the businesses that purchase the fish and the consumer. Such increases may have a negative affect on business in coastal communities that depend on groundfish products for their business.

The level of fleet coverage, that portion of the overall OA fishing fleet that would be required to have VMS and provide declaration reports, is the only difference between the alternatives. The ability to maintain the

integrity of the RCAs is directly related to the level of VMS coverage for OA vessels. In general, the higher the coverage level for vessels that interact with overfished species, the more likely that it is that the integrity of the RCAs can be maintained.

4.4 Cumulative Impacts

Cumulative effects must be considered when evaluating the alternatives to the issues considered in the EA. Cumulative impacts are those combined effects on quality of human environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what federal or non-federal agency undertake such actions (40 CFR 1508.7, 1508.25 (a), and 1508.25 (c))

[Section to be completed]

5.0 CONSISTENCY WITH THE FMP AND OTHER APPLICABLE LAWS

5.1 Consistency with the FMP

The socio-economic framework in the Pacific Coast Groundfish FMP requires that proposed management measures and viable alternatives be reviewed and consideration given to the following criteria: a) how the action is expected to promote achievement of the goals and objectives of the FMP; b) likely impacts on other management measures; c) biological impacts; d) and economic impacts, particularly the cost to the fishing industry; and e) accomplishment of one of a list of factors.

GOALS AND OBJECTIVES OF THE FMP

The Council is committed to developing long-range plans for managing the Pacific Coast groundfish fisheries that prevent overfishing and loss of habitat, yet provide the maximum net value of the resource, and achieve maximum biological yield. Alternatives 2- 7 are consistent with FMP goal 1-objective 1, and goal 3-objective 10.

> Goal 1- Conservation: Objective 1 -- maintain an information flow on the status of the fishery and the fishery resource which allows for informed management decisions as the fishery occurs.
>
> Goal 3- Utilization: Objective 10 -- strive to reduce the economic incentives and regulatory measures that lead to wastage of fish. Also, develop management measures that minimize bycatch to the extent practicable and, to the extent that bycatch cannot be avoided, minimize the mortality of such bycatch. In addition, promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch mortality.

ACCOMPLISHMENT OF ONE OF THE FACTORS LISTED IN FMP SECTION 6.2.3.

Under the socio-economic framework, the proposed action must accomplish at least 1 of the criteria defined in Section 6.2.3 of the FMP. Alternatives 2-7 are likely to accomplish objective 2 by providing information to avoid exceeding a quota, harvest guideline or allocation, and objective 13 by maintaining a data collection and means for verification.

5.2 Magnuson-Stevens Conservation and Management Act

The Magnuson-Stevens Act provides parameters and guidance for federal fisheries management, requiring that the Councils and NMFS adhere to a broad array of policy ideals. Overarching principles for fisheries management are found in the Act's National Standards. In crafting fisheries management regimes, the Councils and NMFS must balance their recommendations to meet these different national standards.

National Standard 1 requires that conservation and management measures shall prevent overfishing while achieving on a continuing basis, the optimum yield from each fishery for the United States fishing industry. The proposed action is to expand a monitoring program to monitor the integrity of closed areas that were established to protect overfished species. Information provided under Alternatives 2- 7 reduce the risk of overfishing because they would provide information that could be used to reduce the likelihood of overfishing while allowing for the harvests of healthy stocks. Because Alternative 6A and 7 provides the most information, they would have the least risk, while Alternative 1 has the greatest risk.

National Standard 2 requires the use of the best available scientific information. The proposed action is to expand a VMS program to monitor the integrity of closed areas that were established to protect overfished species. Data collected under Alternatives 2-7 would be used to understand the level of fishing effort and how it was distributed. When combined with data from the existing federal observer program, it could be used to more accurately estimate total catch.

National Standard 3 requires, to the extent practicable, that an individual stock of fish be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination. This standard is not affected by the proposed action to expand a monitoring program to monitor the integrity of closed areas.

National Standard 4 requires that conservation and management measures not discriminate between residents of different States. None of the alternatives would discriminate between residents of different States.

National Standard 5 is not affected by the proposed actions because it does not affect efficiency in the utilization of fishery resources.

National Standard 6 requires that conservation and management measures take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches." All alternatives meet this standard.

National Standard 7 requires that conservation and management measures minimize costs and avoid unnecessary duplication. Measures were taken to minimize the costs of a monitoring program by reducing the time burden and cost of declaration reports - they would only be required when vessel changes gears rather than on every trip.

National Standard 8 provides protection to fishing communities by requiring that conservation and management measures be consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities. The proposed alternatives are consistent with this standard.

National Standard 9 requires that conservation and management measures minimize bycatch and minimize the mortality of bycatch. NMFS is required to "promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch mortality. The proposed action is consistent with this standard.

National Standard 10 Conservation and Management measures shall, to the extent practicable, promote the safety of human life at sea. Alternatives 2-7 have safety benefits. Thought VMS is not an emergency response system it has been used in search an rescue to determine a vessels last known position and the VMS systems provides for a distress signal that may also reduce response time in an emergency. Alternatives 6A and 7 have the greatest safety benefits because requires VMS for the largest portion of the OA fleet, followed by 5B and then 6B.

Essential Fish Habitat This action will affect fishing in areas designated as essential fish habitat (EFH). The proposed action is to expand a program to monitor the integrity of closed areas that were established to protect overfished species. The potential effects of the proposed actions are not expected to have either no adverse effect on EFH, to have a positive effect resulting from reduced fishing effort in critical areas, or to have a positive effect if used to support regulations to restrict fishing in areas to protect habitat. No EFH consultation is warranted for this action.

5.3 Endangered Species Act

NMFS issued Biological Opinions (B.O.) under the ESA on August 10, 1990, November 26, 1991, August 28, 1992, September 27, 1993, May 14, 1996, and December 15, 1999 pertaining to the effects of the groundfish fishery on chinook salmon (Puget Sound, Snake River spring/summer, Snake River fall, upper Columbia River spring, lower Columbia River, upper Willamette River, Sacramento River winter, Central Valley spring, California coastal), coho salmon (Central California coastal, southern Oregon/northern California coastal), chum salmon (Hood Canal summer, Columbia River), sockeye salmon (Snake River, Ozette Lake), and steelhead (upper, middle and lower Columbia River, Snake River Basin, upper Willamette River, central California coast, California Central Valley, south-central California, northern California, southern California). During the 2000 Pacific whiting season, the whiting fisheries exceeded the 11,000 fish chinook bycatch amount specified in the Pacific whiting fishery B.O. (December 19, 1999) incidental take statement, by approximately 500 fish. In the 2001 whiting season, however, the whiting fishery's chinook bycatch was about 7,000 fish, which approximates the long-term average. After reviewing data from, and management of, the 2000 and 2001 whiting fisheries (including industry bycatch minimization measures), the status of the affected listed chinook, environmental baseline information, and the incidental take statement from the 1999 whiting B.O., NMFS determined that a re-initiation of the 1999 whiting BO was not required. NMFS has concluded that implementation of the FMP for the Pacific Coast groundfish fishery is not expected to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS, or result in the destruction or adverse modification of critical habitat. This proposed rule implements a data collection program and is within the scope of these consultations. Because the impacts of this action fall within the scope of the impacts considered in these B.O.s, additional consultations on these species are not required for this action.

5.4 Marine Mammal Protection Act

Under the MMPA, marine mammals whose abundance falls below the optimum sustainable population level (usually regarded as 60% of carrying capacity or maximum population size) can be listed as "depleted". Populations listed as threatened or endangered under the ESA are automatically depleted under the terms of the MMPA. Currently, the Stellar sea lion population off the West Coast is listed as threatened under the ESA and the fur seal population is listed as depleted under the MMPA. Incidental takes of these species in the Pacific Coast fisheries are well under their annual PBRs. None of the proposed management alternatives are likely to affect the incidental mortality levels of species protected under the MMPA. The West Coast groundfish fisheries are considered Category III fisheries, where the annual mortality and serious injury of a stock by the fishery is less than or equal to 1% of the PBR level. Implementation of Alternatives 2-7 are expected to benefit MMPA species because they would allow observer data and data from other sources to be joined to the VMS data to better understand the extent of potential fishing related impacts on various marine mammal species.

5.5 Coastal Zone Management Act

The proposed alternatives would be implemented in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved coastal zone management programs of Washington, Oregon, and California. This determination has been submitted to the responsible state agencies for review under Section 307(c)(1) of the Coastal Zone Management Act (CZMA). The relationship of the groundfish FMP with the CZMA is discussed in Section 11.7.3 of the groundfish FMP. The groundfish FMP has been found to be consistent with the Washington, Oregon, and California coastal zone management programs. The recommended action is consistent and within the scope of the actions contemplated under the framework FMP. Under the CZMA, each state develops its own coastal zone management program which is then submitted for federal approval. This has resulted in programs that vary widely from one state to the next.

5.6 Paperwork Reduction Act

[Section to be completed]

5.7 Executive Order 12866

This action is not significant under E.O. 12866. This action will not have a cumulative effect on the economy of $100 million or more, nor will it result in a major increase in costs to consumers, industries, government agencies, or geographical regions. No significant adverse impacts are anticipated on competition, employment, investments, productivity, innovation, or competitiveness of U.S.-based enterprises.

5.8 Executive Order 13175

Executive Order 13175 is intended to ensure regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes.

The Secretary of Commerce recognizes the sovereign status and co-manager role of Indian tribes over shared Federal and tribal fishery resources. At Section 302(b)(5), the Magnuson-Stevens Act reserves a seat on the Council for a representative of an Indian tribe with Federally recognized fishing rights from California, Oregon, Washington, or Idaho.

The U.S. government formally recognizes that the four Washington Coastal Tribes (Makah, Quileute, Hoh, and Quinault) have treaty rights to fish for groundfish. In general terms, the quantification of those rights is 50% of the harvestable surplus of groundfish available in the tribes' usual and accustomed (U and A) fishing areas (described at 50 CFR 660.324). Each of the treaty tribes has the discretion to administer their fisheries and to establish their own policies to achieve program objectives. The proposed action is being developed in consultation with the affected tribe(s) and, insofar as possible, with tribal consensus.

5.9 Migratory Bird Treaty Act and Executive Order 13186

The Migratory Bird Treaty Act of 1918 was designed to end the commercial trade of migratory birds and their feathers that, by the early years of the 20th century, had diminished populations of many native bird species. The Act states that it is unlawful to take, kill, or possess migratory birds and their parts (including eggs, nests, and feathers) and is a shared agreement between the United States, Canada, Japan, Mexico, and Russia to protect a common migratory bird resource. The Migratory Bird Treaty Act prohibits the directed take of seabirds, but the incidental take of seabirds does occur. None of the proposed management alternatives, or the Council recommended action are likely to affect the incidental take of seabirds protected by the Migratory Bird Treaty Act. Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) is intended to ensure that each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations develops and implements a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service that shall promote the conservation of migratory bird

populations. Currently, NMFS is developing an MOU with the U.S. Fish and Wildlife Service. None of the proposed management alternatives are likely to have a measurable effect on migratory bird populations.

5.10 Executive Order 12898 (Environmental Justice) and 13132 (Federalism)

There is no specific guidance on application of EO 12898 to fishery management actions. The EO states that environmental justice should be part of an agency's mission "by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority or low-income populations." These recommendations would not have federalism implications subject to E.O. 13132. State representatives on the Council have been fully consulted in the development of this policy recommendation.

6.0 REGULATORY IMPACT REVIEW AND REGULATORY FLEXIBILITY ANALYSIS

The RIR and IRFA analyses have many aspects in common with each other and with EAs. Much of the information required for the RIR and IRFA analysis has been provided above in the EA. Table 6.0.1 identifies where previous discussions relevant to the EA and IRFA can be found in this document. In addition to the information provided in the EA, above, a basic economic profile of the fishery is provided annually in the Council's SAFE document.

Table 6.0 1 Regulatory Impact Review and Regulatory Flexibility Analysis

RIR Elements of Analysis	Corresponding Sections in EA	IRFA Elements of Analysis	Corresponding Sections in EA
Description of management objectives		Description of why actions are being considered	
Description of the Fishery		Statement of the objectives of, and legal basis for actions	
Statement of the Problem		Description of projected reporting, recordkeeping and other compliance requirements of the proposed action	
Description of each selected alternative		Identification of all relevant Federal rules	
An economic analysis of the expected effects of each selected alternative relative to status quo			

[Section to be completed]

6.1 Regulatory Impact Review

[Section to be completed]

The RIR is designed to determine whether the proposed action could be considered a "significant regulatory actions" according to E.O. 12866. E.O. 12866 test requirements used to assess whether or not an action would be a "significant regulatory action", and identifies the expected outcomes of the proposed management alternatives. 1) Have a annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities;2) Create a serious inconsistency or otherwise interfere with action taken or planned by another agency; 3) Materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or 4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive Order. Based on results of the economic analysis contained in Section 4.3, this action is not expected to be significant under E.O. 12866.

Requirements of an IRFA

The Regulatory Flexibility Act (5 U.S.C. 603) states that:
(b) Each initial regulatory flexibility analysis required under this section shall contain--

(1) a description of the reasons why action by the agency is being considered:
(2) a succinct statement of the objectives of, and legal basis for, the proposed rule;
(3) a description of and, where feasible, and estimate of the number of small entities to which the proposed rule will apply;
(4) a description of the projected reporting, recordkeeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
(5) an identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule.

(c) Each initial regulatory flexibility analysis shall also contain a description of any significant alternatives to the prosed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives such as--

(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
(2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;
(3) the use of performance rather than design standards; and
(4) an exemption from coverage of the rule, or any part thereof, for such small entities.

6.2 Initial Regulatory Flexibility Analysis

When an agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an Initial Regulatory Flexibility Analysis (IRFA) that describes the impact on small businesses, non-profit enterprises, local governments, and other small entities. The IRFA is to aid the agency in considering all reasonable regulatory alternatives that would minimize the economic impact on affected small entities (attachment 1). To ensure a broad consideration of impacts on small entities, NMFS has prepared this IRFA without first making the threshold determination whether this proposed action could be certified as not having a significant economic impact on a substantial number of small entities. NMFS, must determine such certification to be appropriate if established by information received in the public comment period.

1) A description of the reasons why the action by the agency is being considered.

2) A succinct statement of the objectives of, and legal basis for, the proposed rule.

3) A description of and, where feasible, and estimate of the number of small entities to which the proposed rule will apply;

4) A description of the projected reporting, recordkeeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record.

5) An identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule.

6) A summary of economic impacts.

7) A description of any alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimizes and significant economic impacts of the proposed rule on small entities.

7.0 List of Preparers

This document was prepared by the Northwest Regional Office of the NMFS. 8.0 References

[Section to be completed]

8.0 References

XXX INCOMPLETE - ADD NEW XXX

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